BANNER®

more sensors, more solutions

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PresencePLUS®

Vision Sensors & Lighting

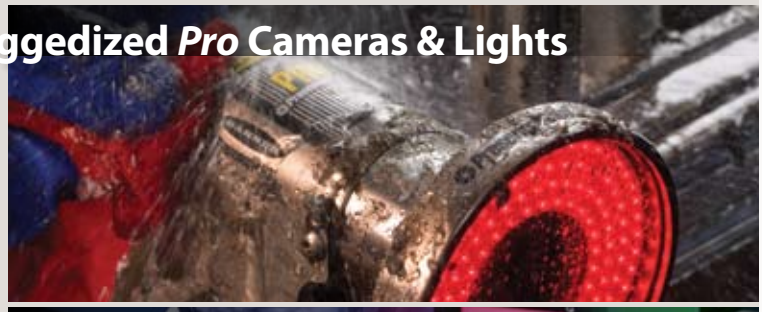
THIRD EDITION

New models to solve your toughest inspection challenges.

*Presence*PLUS® *Pro* & *P4* COLOR

Offers color sensing in two convenient packages.
Page 8

Ruggedized *Pro* Cameras & Lights



Delivers all the functionality and features of advanced vision into harsh IP68 environments.
Page 6

P4 OMNI

A compact, integrated vision sensor with features for the most demanding applications.
Page 16

Bar Code Reading

Decodes 2D and 1D linear bar codes in the toughest low-light/low-contrast conditions.
Page 10

Lighting

Offers a complete selection of basic and specialty lighting solutions to enhance vision capabilities.
Page 30

more sensors, more solutions

When the world thinks of sensors, it thinks of Banner.

With more than 17,000 photoelectric, ultrasonic and vision sensors, and safety products available worldwide, Banner is the most innovative, most experienced name in sensors. For simple to complex applications, Banner has more sensor solutions than any other manufacturer.

The innovation leader with more than 40 years of sensor development and application expertise, Banner understands the challenges of sensing in manufacturing and process industries. Banner has more than 3,000 factory and field representatives worldwide, as well as the largest force of application engineers in the industry who solve thousands of the most challenging applications every year.

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Advanced vision solutions from the number one name in sensors.

Vision sensing from the source you trust.

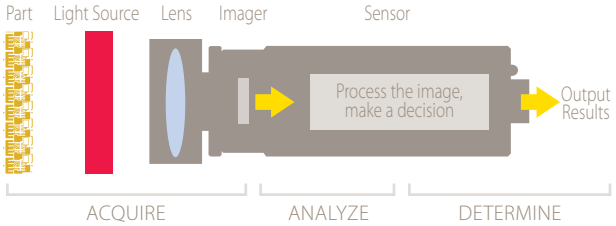
As the prefered brand of sensors worldwide, Banner knows the challenges of the factory floor. That's why we designed our line of *Presence*PLUS® vision sensors from the ground up, with advanced features, easier setup and operation, rugged design, the most value of any vision systems in the market and, most of all, Banner reliability and support.

A complete solution.

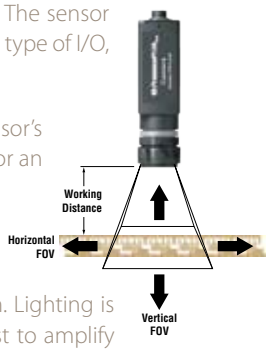
From a single inspection point to plant-wide vision integration, Banner offers complete vision solutions. Vision sensing has two major elements: hardware—the camera, controller, lighting and brackets; and software— the control system, graphical user interface and image algorithms. Banner provides all of the elements to successfully deploy vision sensing in your facility.

Visual Inspection Process

1. *Acquire* an image of the part.
2. *Analyze* the image.
3. *Determine* if the inspection passes or fails, and report the results to the manufacturing line. The part then either passes to the next process or is rejected and removed.

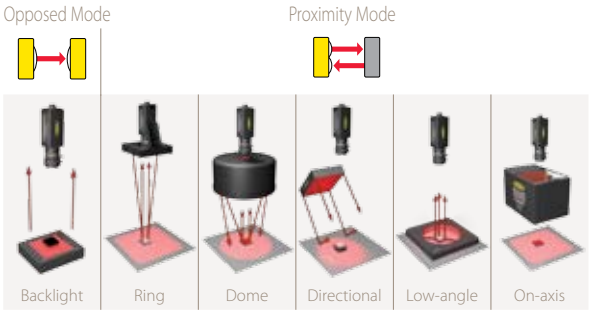


1. **Sensor:** The sensor contains the imager, microprocessor and I/O. The imager has an array of tiny light-sensitive cells (pixels) that convert the target into an image. The microprocessor analyzes the image and makes determinations about it based on user-determined tolerances and criteria. The sensor exports the inspection results through some type of I/O, such as discrete, Ethernet or serial.



2. **Lens:** The lens focuses the light onto the sensor's imager. To determine the lens focal length for an applications, specify the field of view and working distance.

3. **Light Source:** The light source is a critical component of any vision inspection system. Lighting is the most powerful tool for creating contrast to amplify the feature of interest, while minimizing other features of the part. Selecting the best light source depends on the shape, surface texture, color and opacity of the part.



Affordable sensing technology that's easy to use.

The best value in vision.

- The best price-performance ratio brings full vision capabilities to all sensor specifiers.
- Simple, easy-to-use interface.
- Easy to justify cost for multiple applications.
- No software maintenance fees—free firmware & PC software upgrades.
- Hundreds of lens and lighting options.
- Superior in-house manufacturing and quality.

"The substantially lower cost of the Banner vision sensor makes it feasible to set up more inspection systems."
–Major automotive manufacturer

The easiest-to-use vision sensors available.

- Easy, menu-driven, point and click interface.
- Remote TEACH input similar to a photoelectric sensor.
- Simple inspection changeovers.
- Live video display without a PC.
- User interface software that allows setup and seamless operation in nine languages.

"One of the most beneficial, yet simple, advantages of the Banner vision sensor was its TEACH tool. This tool was extremely valuable for eliminating guess work and applying the statistical variation."
–Automotive engineer

The best vision sensor performance.

- Inspection speeds faster than 10,000 parts per minute.
- Full 360° fixture-free inspection.
- Locates inspection detail, regardless of orientation.
- Solves the most applications in your plant.
- Full suite of grayscale, color and binary vision tools.

"The PresencePLUS® vision sensor not only saved time and freed up our quarantined product, it provided a level of documentation."
–Metal stampings manufacturer

More sensors, more solutions, more customer support.

- Superior vision products from the leader in sensing.
- More than 17,000 photoelectric, ultrasonic and vision sensors available worldwide.
- Experienced factory application engineers to solve your most advanced sensing challenges.
- More than 3,000 trained factory and field representatives worldwide.
- Complete factory training, field training and online training.
- Helps you achieve 100% quality inspection and zero defect manufacturing.

"I appreciate the level of expertise the field rep showed with the PresencePLUS sensors and how he has helped me with other difficult applications in the past."
–Major consumer goods manufacturer

Machine vision made simple.

Robust inspection solutions. With more advanced capabilities.

From simple verification to complex inspection, Banner has the most powerful and affordable vision systems and sensors, built to perform in high-speed manufacturing and production environments. Banner provides an alternative to costly, complex machine vision systems with proven, easy-to-use and affordable self-contained vision sensors for real-world applications.

Select the *Presence*PLUS® *Pro* which incorporates remote cameras paired with powerful controller units featuring 11 location, vision and analysis tools. Or, choose the versatile new, self-contained *Presence*PLUS *P4* OMNI with easy TEACH setup. To deploy the precise inspection capability where you need it, select from four *Presence*PLUS *P4* series vision sensors with dedicated functionality.

Banner machine vision solutions are available in standard resolution and high-resolution 1.3 megapixel models for more detailed inspections, as well as sealed, IP68-rated models for rugged industrial and washdown environments. *P4* models are available in both in-line and right-angle configurations. These options, as well as a complete selection of Banner lenses, lighting and brackets, provide complete, high-speed inspection capabilities in the vast majority of applications.

Banner Machine Vision

EXAMPLE APPLICATIONS

Add inspection capabilities where you need them. *Presence*PLUS® *Pro* and *P4* vision sensors integrate easily into existing production systems to provide new levels of quality control, error proofing and verification.

Vial Fill Level and Cap Seal Verification

To rapidly verify that vials are filled to the correct level and that caps are correctly aligned, a high-speed *Presence*PLUS *P4* EDGE vision sensor locates the vial and verifies the fill level and cap placement.

Food Packaging Error Proofing

Each unit of pastry dough is inspected by a *Presence*PLUS *P4* AREA vision sensor to detect the presence of a frosting packet—ensuring that one is included in each package.

Rivet Inspection

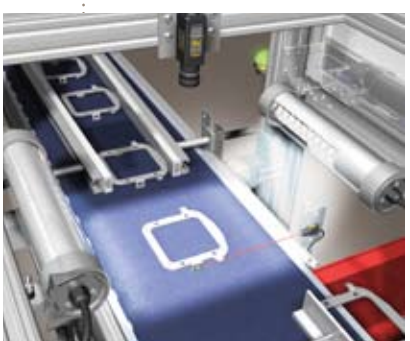
Following installation of a rivet into each corner of an automobile steering wheel horn frame assembly, the component passes beneath a *Presence*PLUS *Pro* vision sensor to verify the presence and quality of each rivet.

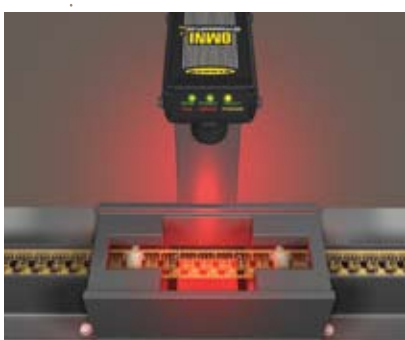
Gum Wedge Inspection

A high-resolution *Presence*PLUS *P4* EDGE 1.3 vision sensor combines with a laser line to inspect the beveled gum wedge of continuously extruded rubber. The laser line bends at the bevel, allowing a cost-effective two-dimensional vision sensor to perform a three-dimensional measurement.

Stamped Metal Pin Inspection

To verify the quantity, pitch and straightness of connector pins on a stamped metal subassembly, the high-resolution *Presence*PLUS *P4* OMNI 1.3 vision sensor counts the number of connector pins, simultaneously detecting irregular gaps that indicate pins are bent or missing.





Color Vision Sophistication. Banner Simplicity. Banner's *Presence*PLUS® *Pro* COLOR and *P4* COLOR vision sensors combine with the comprehensive suite of *Presence*PLUS inspection tools to deliver an easy-to-apply, color-based vision inspection solution of extraordinary sophistication for significantly less than comparable systems.

Unlimited color spectrum analysis for your most challenging applications.

For inspection features best examined by spectral analysis, Banner offers solutions designed to meet your requirements and fit your machinery. The new one-piece *Presence*PLUS® *P4* COLOR OMNI and the compact *Presence*PLUS® *Pro* COLOR sensor with a separate DIN-mountable controller offer two powerful platforms for color vision applications—with all of the robust inspection tools and capabilities of their gray scale counterparts.

*Presence*PLUS *Pro* COLOR and *P4* COLOR OMNI vision sensors inspect unlimited color variations visible in the camera's field of view. Shape and color data can be combined to identify minute variations and color consistency can be monitored within a taught range of acceptable color.

Combining intuitive *Presence*PLUS software, remote TEACH for rapid configuration and a precision 752 x 480 pixel resolution color CMOS imager, *Presence*PLUS *Pro* COLOR and *P4* COLOR OMNI vision sensors inspect for a specific color or color range taught to the sensor with the Color Match tool. All models include the powerful suite of gray scale vision tools—including Locate, Pattern Find and Count, Geometric Find and Count, Edge, Object, Blob and Average Gray Scale—that deliver extraordinary precision and versatility, for the most demanding inspections.

Candy Color Inspection

A *Presence*PLUS *P4* COLOR OMNI mounted above a conveyor inspects each box of 12 chocolates, making sure each paper nest contains the correct type, based on color. It rejects boxes that have the wrong chocolate in a nest, are missing product or have damaged product.

Color Inspection and Verification

A *Presence*PLUS *Pro* COLOR vision sensor verifies that pour spouts inserted into detergent bottles are present, fully inserted and of the correct color to match the bottle. The IP68 sealed housing protects the sensor and light from liquids.

Automotive Fuse Box Error Proofing

To verify that fuses of the specified amperage are placed in the correct location in an automotive fuse box assembly, a *Presence*PLUS *Pro* COLOR vision sensor using a Banner White Area Light provides fast and easy error proofing.

Comprehensive Blister Pack Inspection

Tightened federal regulations require critical quality controls in pharmaceutical packaging. A *Presence*PLUS *Pro* COLOR vision sensor under a Banner Tubular Fluorescent Light inspects blister packs to ensure each blister contains the correct tablet, verifies each tablet is unbroken, and detects empty blisters or those containing foreign matter.

Cap and Fill Inspection

As glass bottles pass on a high-speed conveyor, a *Presence*PLUS *P4* COLOR OMNI confirms each bottle is completely filled, while verifying the stopper is fully inserted and is the correct color. Dual Banner Area Lights bracket directly to the sensor to create the optimum contrast for the inspection.

EXAMPLE APPLICATIONS

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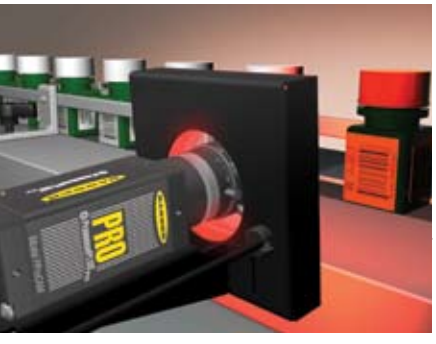


Accurately reads and grades 2D and 1D bar codes.

A traceability program is only as successful as the vision sensor that reads 2D or 1D bar codes under plant conditions. That's why major manufacturers depend on the industry's most reliable sensor expert for their vision needs. Banner's *Presence*PLUS® *Pro* and *P4* OMNI with optional bar code reading software offer tremendous power and flexibility, for accurate high-speed bar code reading in the toughest environments. The *Presence*PLUS® *P4* BCR and high-resolution BCR 1.3 vision sensors have been developed from the ground up for the most robust 2D and 1D linear bar code reading capabilities—even when conditions and codes are less than ideal.

Whether for production traceability of direct-marked manufactured components or to verify product lots for consumer goods, Banner *Presence*PLUS sensors are engineered to offer the highest read rates in low contrast/poor visibility conditions, or where marked or formed bar codes have degraded. The BCR is "taught" the correct codes, either with the sensor itself or over an industrial Ethernet network (EIP or Modbus TCP/IP). Banner's dedicated BCR solutions keep lines moving by reading despite problems such as low contrast, shadows, orientation, surface variations or marking variables resulting from degraded etching, stamping or printing.

BCR models read 2D Data Matrix ECC200 and 1D linear bar codes such as Code 39, Code 128, Codabar, Interleaved 2 of 5, EAN-8 and EAN-13 (supports UPC-A), UPC-E and Postnet. High-resolution BCR 1.3 models (1280 x 1024 pixels) feature 1.3 megapixel imaging that reads and grades smaller bar codes, or allows larger fields of view. Codes and code grades can be communicated using the BCR's serial port.

2D Stamped Bar Code Verification

Manufacturing lots can be tracked for quality assurance using a *Presence*PLUS *Pro* bar code reader to detect and verify a subtle 2D bar code stamped into metal parts. Advanced 2D capabilities and a Banner Low-Angle Ring Light facilitate detection of bar codes subject to stamping quality variables.

Simultaneous Verification of Two Bar Codes

The high-resolution *Presence*PLUS *P4* BCR 1.3 delivers an extended field of view to read 1D linear and 2D bar codes simultaneously to verify components in an assembly are correctly paired. Strobed ring lighting and 1.3 megapixel resolution provide increased image repeat rates for accurate reading at full line speed.

Large Area Verification for Sorting and Die Protection

The dies in tire presses suffer costly damage if the press tries to stamp tread into an unstamped, or green, tire of the wrong size. To direct each tire to the correct press at production line speeds, a series of six high-resolution *Presence*PLUS *P4* BCR 1.3 vision sensors sort green tires based on bar code data printed on a label on the tire's bead, regardless of position or orientation.

Miniature Bar Code Verification

The advanced functionality of the *Presence*PLUS *P4* BCR reads and verifies miniaturized symbology, such as 2D bar codes, on small electronic components. A Banner Backlight through the semi-transparent circuit membrane optimizes contrast of the code for optimal reading conditions at high line speeds.

Pharmaceutical Product ID and Lot Control

Federal pharmaceutical product identification and lot control requirements are both stringent and evolving. The *Presence*PLUS *Pro* gives you the power and flexibility to future-proof inspection, verification and tracking capabilities.

Part traceability using direct-marked 2D Data Matrix bar codes demands extraordinary levels of reliable performance from code reading tools. With a proven foundation of industrial sensor reliability, Banner's *Presence*PLUS® *P4* BCR sensors handle the toughest 2D and 1D bar code reading chores at the highest throughput rates.

Setting up an application is easy. Advanced *Presence*PLUS® software offers point-and-click setup without any knowledge of programming languages. Set up an inspection by simply illuminating the target, focusing the camera and selecting the features to analyze.

Powerful Inspection Tools. One Advanced Software Platform.

Fulfilling the capabilities of powerful *Presence*PLUS® vision sensor hardware requires an equally advanced software solution. One that operates seamlessly across all Banner vision products. One that provides a common, intuitive graphical interface. One so advanced, it can literally teach itself your vision challenge.

Banner's versatile *Presence*PLUS software does just that. Now configuring sophisticated vision applications is faster and easier than ever before, while common applications are virtually plug-and-play.

Features:

- Seamless functionality across the entire *Pro* and *P4* vision sensor series.
- Remote TEACH input similar to a photoelectric sensor self-learns the inspection tolerances of your application.
- Easy, menu-driven, point-and-click interface on a PC.
- Simple push-button inspection changeovers.
- Live video display without a PC.
- ActiveX utilities for exporting inspections, images and results.
- Direct connectivity to EtherNet/IP and Modbus TCP industrial networks.
- In nine languages including English, Simplified Chinese, Traditional Chinese, French, German, Japanese, Portuguese and Spanish with translated text, buttons, commands and icons in the respective language.
- Operates on Microsoft Windows® operating systems.
- Free web download or CD-ROM; includes all Banner vision sensor manuals, troubleshooting guides, and lens and lighting selection guides.
- Free firmware and software upgrades.

*Presence*PLUS Software Operation

3-point click-and-go Intuitive, wizard-like graphics walk the operator through adjusting the sensor position, selecting the features to inspect, operating the sensor and monitoring its outputs.

Setup Dynamically view the sensor image, adjust the lighting position and intensity, and then focus the lens to maximize contrast between target features and the background.

Tools Highlight the features to inspect while selecting tools and filters to maximize robust operation. Choose criteria and margins for good or failed outputs. Select data or images to communicate through the Ethernet or serial ports.

Run Operate inspections and sensor outputs while viewing images or exploring the detailed, comprehensive inspection results. Select the inspection to run. Log any inspection to archive its images and results.

*Presence*PLUS: A Comprehensive Suite of Inspection and Analysis Tools.

LOCATION TOOLS *compensate for translational and rotational movement.*

Locate Determines translation and rotation by detecting relative movement of edges

Pattern Find Determines translation and rotation by detecting relative movement of a pattern

GEO Find Determines translation and rotation movement of a part up to 360° by detecting relative movement of a pattern

VISION TOOLS *analyze the image.*

Color Match Inspects for matching hue and intensity

Average Gray Scale Determines the gray scale intensity value of an area

Blob Determines the presence, connectivity, size and location of selected features

Edge Determines the presence, number, classification and location of edges

Object Determines the presence, number, classification, size and location of objects

Pattern Count Determines the presence, number and location of pattern(s)

GEO Count Detects the presence and location of a target pattern in any orientation

Bar Code Finds, decodes and grades advanced 2D and 1D linear bar codes

ANALYSIS TOOLS *measure and evaluate the results of the vision tools.*

Measure Measures distance and angles between two prescribed points or lines

Math Performs arithmetic functions on any tool or constant

Test Evaluates results of selected vision and analysis tools to determine whether an inspection passes or fails; performs logical operations; and activates outputs

Communication Sends image or results of selected location, vision and analysis tools over the Ethernet or RS-232 serial communication ports to industrial Ethernet or PC networks

*Presence*PLUS® *Pro & P4* General-Purpose Sensors

	PROII	PROII 1.3	IP68 PROII	IP68 PROII 1.3	OMNI	OMNI 1.3
Hardware	Page 20				Page 22	
Integrated I/O	14	14	14	14	7	7
Interchangeable Lenses	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount
Interchangeable Lighting	✔	✔	✔	✔	✔	✔
Imager	CCD	CMOS	CCD	CMOS	CCD	CMOS
Resolution	640 x 480	1280 x 1024	640 x 480	1280 x 1024	640 x 480	1280 x 1024
Imager Speed	48 fps	18 fps	48 fps	18 fps	48 fps	27 fps
Color Models	✔		✔		✔	
Live Video Output	✔	✔	✔	✔	✔	✔
Power Requirements	10-30V dc	10-30V dc	10-30V dc	10-30V dc	10-30V dc	10-30V dc
Trigger	Internal or External	Internal or External	Internal or External	Internal or External	Internal or External	Internal or External
Memory	64 MB	64 MB	64 MB	64 MB	32 MB	32 MB
Inspection Storage (Max.)	999	999	999	999	999	999
Communications						
Ethernet	10/100	10/100	10/100	10/100	10/100	10/100
Serial	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232
Programmable Discrete I/O	6	6	6	6	4	4
Programming/Interface						
User Interface Languages Supported *(English, German, Japanese, Chinese, Spanish, French, Italian, Portugese)*	9	9	9	9	9	9
Industrial Ethernet Protocols	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP
Software Upgrades	Free	Free	Free	Free	Free	Free
Runs without a PC	Yes	Yes	Yes	Yes	Yes	Yes
ActiveX Interface	✔	✔	✔	✔	✔	✔
Quick TEACH	✔	✔	✔	✔	✔	✔
Remote Teach	✔	✔	✔	✔	✔	✔
External Inspection Storage & Operations	✔	✔	✔	✔	✔	✔

► COMMON **User Interface** 9 Languages *across all Banner Vision products*

*Presence*PLUS® *P4* Dedicated-Function Sensors

AREA	AREA 1.3	EDGE	EDGE 1.3	GEO	GEO 1.3	BCR	BCR 1.3
Page 23							
7	7	7	7	7	7	7	7
C-mount	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount
✔	✔	✔	✔	✔	✔	✔	✔
CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CCD	CMOS
128 x 100	1280 x 1024	128 x 100	1280 x 1024	128 x 100	1280 x 1024	640 x 480	1280 x 1024
500 fps	27 fps	500 fps	27 fps	500 fps	27 fps	48 fps	27 fps
✔	✔	✔	✔	✔	✔	✔	✔
10-30V dc	10-30V dc	10-30V dc	10-30V dc	10-30V dc	10-30V dc	10-30V dc	10-30V dc
Internal or External	Internal or External	Internal or External	Internal or External	Internal or External	Internal or External	Internal or External	Internal or External
8 MB	32 MB	8 MB	32 MB	8 MB	32 MB	8 MB	32 MB
500	999	500	999	500	999	400	999
10/100	10/100	10/100	10/100	10/100	10/100	10/100	10/100
RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232
4	4	4	4	4	4	4	4
9	9	9	9	9	9	9	9
EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP	EthnerNet/IP & Modbus TCP/IP
Free	Free	Free	Free	Free	Free	Free	Free
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
✔	✔	✔	✔	✔	✔	✔	✔
✔	✔	✔	✔	✔	✔	✔	✔
✔	✔	✔	✔	✔	✔	✔	✔
✔	✔	✔	✔	✔	✔	✔	✔

► **FREE Software & Firmware UPGRADES**

Affordable full-feature vision sensor solutions. No compromises.

***Presence*PLUS® *Pro* Series**
- Full-featured; compact camera with separate DIN-mountable controller
- Convenient 20-pin removable terminal block
- Six bicolor bright LED indicators
- Fourteen configurable discrete I/O (NPN/PNP)

PROII Models

*Presence*PLUS *Pro*
640 X 480 resolution CCD

*Presence*PLUS *Pro* COLOR
752 X 480 resolution CMOS

*Presence*PLUS *Pro 1.3*
1280 X 1024 resolution CMOS

*Presence*PLUS *Pro* sealed cameras
Rugged, IP68 housing

***Presence*PLUS® *P4* OMNI Series**
- Full featured; economical one-piece design
- Seven configurable discrete I/O (NPN/PNP)
- Three bicolor bright LED indicators
- In-line or right-angle housing

***P4* OMNI Models**

*Presence*PLUS *P4* OMNI
640 X 480 resolution CCD

*Presence*PLUS *P4* OMNI COLOR
752 X 480 resolution CMOS

*Presence*PLUS *P4* OMNI 1.3
1280 X 1024 resolution CMOS

The *Presence*PLUS® *Pro* and *Presence*PLUS® *P4* OMNI vision sensors deliver professional, image-based inspection capabilities to your factory floor—at an unprecedented price. Banner has transformed costly, complex machine vision systems into easy-to-use, workhorse sensors that solve real-world applications. Now you can quickly integrate inspection capabilities anywhere you need them, at a cost that's easy to justify and provides immediate ROI. Banner innovation has revolutionized vision inspection by consolidating a host of powerful features into two advanced hardware platforms, available in standard, color, high-resolution and IP68 sealed models.

***Presence*PLUS Series Features:**
- Universal software with three-step, point-and-click setup.
- Ethernet, serial and flexible discrete I/O in the same full-featured sensor.
- Direct connectivity for all I/O to EtherNet/IP and Modbus TCP.
- ActiveX connectivity to create custom operator control software with object-oriented programming.
- Real-time video output for direct connection to a conventional monitor without a PC.
- Remote and Quick TEACH with a single reference image or custom setup.
- Color, IP68 housing and high-resolution 1.3 megapixel models.
- Complete suite of location, inspection, analysis and geometric tools; all can be used simultaneously for inspecting multiple features and complex applications.
- Multiple inspection routines, stored and accessed without a PC.
- Microsoft Windows® compatible OS with intuitive Wizard-like setup procedure and common graphical interface; supports nine languages.
- Complete selection of lenses, lighting, brackets and accessories.
- 10 to 30V dc operation.

Comprehensive vision capabilities in an affordable, easy-to-use sensor. Banner's *Presence*PLUS® general-purpose vision sensors offer location, vision and analysis tools that can be used together to solve nearly any inspection challenge.

Solve specific inspection challenges. Banner's *Presence*PLUS® *P4* series of dedicated-function vision sensors delivers the performance and ease of use you need in a affordable, practical solution for any size manufacturer.

Robust, affordable vision solutions solve specific inspection challenges.

In the past, machine vision was practical only for complex, mission-critical inspection applications at considerable expense. Banner's *Presence*PLUS® vision sensors changed everything, bringing high-performance inspection capabilities with ease-of-use and affordability—priced for general industry. Now, Banner revolutionizes vision again, with a family of four powerful, affordable vision sensors dedicated to solving the most common inspection challenges. *Presence*PLUS® *P4* series dedicated-function sensors offer just the tools you need, in a price-performance breakthrough that simplifies vision inspection and makes it practical.

*Presence*PLUS *P4* Dedicated-Function Sensors:

- Four models with Locate, Measure, Math, Test, Communications and specific vision tools
- High-performance vision inspections in self-contained in-line or right-angle housing styles that fit in the palm of your hand
- Standardized GUI supports nine languages
- Remote TEACH function for inspection changeovers without a PC
- Connects directly to real-time video display without a PC
- Communicates over Ethernet, configurable discrete I/O and RS-232 serial lines
- Provides direct connectivity to EtherNet/IP and Modbus TCP industrial networks
- ActiveX utilities for custom operator controls
- Available with a variety of mounting brackets, lenses and lighting accessories

*Presence*PLUS *P4* AREA and AREA 1.3:

- Inspects presence and size of defined areas using Blob and Gray Scale tools to capture and analyze images and render pass-fail judgements
- Ideal for high-speed quality control, such as sorting, assembly error proofing, feature identification and counting, orientation confirmation, process control, complete case inspection and flaw detection

*Presence*PLUS *P4* GEO and GEO 1.3:

- Performs 360° fixture-free inspections using GEO Count tool to detect the presence and location of a pattern, regardless of product orientation or position in the sensor's field of view
- Ideal for part identification and orientation, pre-packaging assembly verification, error proofing and label verification

*Presence*PLUS *P4* EDGE and EDGE 1.3:

- Measures multiple edges of a product using Edge and Object tools to gauge height, width, location and edges of selected areas
- Ideal for part identification and orientation, assembly verification, error proofing, label verification, quality control sorting and measuring applications

*Presence*PLUS *P4* BCR and BCR 1.3:

- Reads and decodes 2D and 1D linear bar codes; grades codes using industry standard metrics
- Reads Data Matrix (ECC200) and standard linear codes including Code 39, Code 128, Codabar, Interleaved 2 of 5, EAN-8, EAN-13 (supports UPC-A), UPC-E and Postnet
- High-resolution model reads and grades smaller bar codes in larger fields of view

***Presence*PLUS *P4* AREA**

- Uses Blob and Gray Scale tools for basic inspections of defined areas
- High-speed analysis up to 10,000 parts per minute
- Standard resolution: 128 X 100
- High-resolution: 1280 X 1024

***Presence*PLUS *P4* GEO**

- Uses GEO Count tool to detect presence, location and rotation of a target pattern (360°)
- Standard resolution: 128 X 100
- High-resolution: 1280 X 1024

***Presence*PLUS *P4* EDGE**

- Uses Edge and Object tools to validate height, width, location and edges
- High-speed analysis faster than 10,000 parts per minute
- Standard resolution: 128 X 100
- High-resolution: 1280 X 1024

***Presence*PLUS *P4* BCR**

- Finds and decodes 2D and 1D linear bar codes
- Industry standard bar code metrics and grading
- Standard resolution: 640 X 480
- High-resolution: 1280 X 1024

*Presence*PLUS® *Pro* Sensors

- A full-featured vision sensor for advanced inspections
- Compact camera with separate DIN mountable controller
- A complete suite of location, inspection, analysis and geometric tools
- Color, IP68 housing and high-resolution models

Controllers

	Model Number:	PPROCTL	PPROCTLBCR	PPROCTL1.3	PPROCTL1.3BCR	PPROCTLC	PPROCTLCBCR
	Vision Tools:	PROII Gray Scale	PROII Gray Scale with Bar Code	PROII Gray Scale	PROII Gray Scale with Bar Code	COLOR PROII	COLOR PROII with Bar Code
	Resolution:	640 x 480		1280 x 1024		752 x 480	
	Cameras	**Model Number**		**Model Number**		**Model Number**	**Ring Light**	**Window**
***Pro* Cameras**		PPROCAM		PPROCAM1.3		PPROCAMC	—	—
Sealed *Pro* Cameras		PPROCAMSC-G		PPROCAM1.3SC-G		PPROCAMCSC-G	Cover (No Light)	Glass
		PPROCAMSC-P		PPROCAM1.3SC-P		PPROCAMCSC-P		Plastic
		PPROCAMSR-G		PPROCAM1.3SR-G		—	Red	Glass
		PPROCAMSR-P		PPROCAM1.3SR-P				Plastic
		PPROCAMSI-G		PPROCAM1.3SI-G		—	Infrared	Glass
		PPROCAMSI-P		PPROCAM1.3SI-P				Plastic
		PPROCAMSB-G		PPROCAM1.3SB-G		—	Blue	Glass
		PPROCAMSB-P		PPROCAM1.3SB-P				Plastic
		PPROCAMSG-G		PPROCAM1.3SG-G		—	Green	Glass
		PPROCAMSG-P		PPROCAM1.3SG-P				Plastic
		PPROCAMSW-G		PPROCAM1.3SW-G		PPROCAMCSW-G	White	Glass
		PPROCAMSW-P		PPROCAM1.3SW-P		PPROCAMCSW-P		Plastic

More information online at **bannerengineering.com**

Pro Basic Kit Model Key

Basic kits include a controller, camera, camera-to-controller cordset, CD-ROM and quick start guide.

Controller and Camera	Camera-to-Controller Cordset Length	Cordset Style
P P __ K	0 6	

Blank = PPROCTL Controller & PPROCAM Camera
1.3 = PPROCTL1.3 Controller & PPROCAM1.3 Camera
B = PPROCTLBCR Controller & PPROCAM Camera
1.3B = PPROCTL1.3BCR Controller & PPROCAM1.3 Camera
C = PPROCTLC Controller & PPROCAMC Camera
CB = PPROCTLCBCR Controller & PPROCAMC Camera

06 = 2 m
23 = 7 m

Blank = Straight
R = Right-Angle
H = High-Flex
RH = Right-Angle, High-Flex

Sealed *Pro* Basic Kit Model Key

Basic kits include a controller, sealed camera with cover or ring light, camera, camera-to-controller cordset, ring light power cable, CD-ROM and quick start guide.

Controller and Sealed Camera		Sealed Ring Light		Window		Cordset/Cable Length
P P __ K S		R	—	G	—	13

Blank = PPROCTL Controller & PPROCAMS Camera
1.3 = PPROCTL1.3 Controller & PPROCAM1.3S Camera
B = PPROCTLBCR Controller & PPROCAMS Camera
1.3B = PPROCTL1.3BCR Controller & PPROCAM1.3S Camera
C = PPROCTLC Controller & PPROCAMCS Camera
CB = PPROCTLCBCR Controller & PPROCAMCS Camera

C = Cover (no Light)
W = White
R = Red*
G = Green*
B = Blue*
I = Infrared*

G = Glass
P = Plastic

13 = 4 m
23 = 7 m

** Not recommended for color applications*

*Presence*PLUS® *P4* General-Purpose Sensors

- Full-featured vision sensors for advanced inspections
- One-piece in-line or right-angle housings
- Color and high-resolution models

P4 Sensors with OMNI Tool Set

	Model Number	Vision Tools	Housing	Resolution
	**P40R**	OMNI Gray Scale	Right-Angle	640 x 480
	P40I		In-Line	
	P401.3R		Right-Angle	1280 x 1024
	P401.3I		In-Line	
	**P40BR**	OMNI Gray Scale with Bar Code	Right-Angle	640 x 480
	P40BI		In-Line	
	P401.3BR		Right-Angle	1280 x 1024
	P401.3BI		In-Line	
	**P4COR**	COLOR OMNI	Right-Angle	752 x 480
	P4COI		In-Line	
	**P4COBR**	COLOR OMNI with Bar Code	Right-Angle	752 x 480
	P4COBI		In-Line	

P4 with OMNI Tool Set Basic Kits

Basic kits include a sensor, bracket, cable, CD-ROM and quick start guide.

Sensor	Tools	Resolution	Additional Tools	Housing	Cable Length
P 4	**0**			**R K**	**0 6**

Tools
- **0** = OMNI Gray Scale
- **CO** = COLOR OMNI

Resolution
- **Blank** = Standard Version
- **1.3** = 1.3 Megapixel Resolution

Additional Tools
- **B** = Bar Code Reader

Housing
- **RK** = Right-Angle Kit
- **IK** = In-Line Kit

Cable Length
- **06** = 2 m
- **23** = 7 m
- **32** = 10 m
- **50** = 16 m
- **75** = 23 m

More information online at **bannerengineering.com**

*Presence*PLUS® *P4* Dedicated-Function Sensors

- Family of four vision sensors for specific inspection challenges
- One-piece in-line or right-angle housings
- High-resolution 1.3 megapixel models for more detailed inspections and increased field of view

P4 Sensors with Simplified Tool Set

Model Number	Vision Tools	Housing	Resolution
 **P4AR**	AREA Blob & Gray Scale	Right-Angle	128 x 100
P4AI		In-Line	
P4A1.3R		Right-Angle	1280 x 1024
P4A1.3I		In-Line	
 **P4GR**	GEO Count & Find	Right-Angle	128 x 100
P4GI		In-Line	
P4G1.3R		Right-Angle	1280 x 1024
P4G1.3I		In-Line	
 **P4ER**	EDGE Edge & Object	Right-Angle	128 x 100
P4EI		In-Line	
P4E1.3R		Right-Angle	1280 x 1024
P4E1.3I		In-Line	
 **P4BCR**	BCR Bar Code Reader	Right-Angle	640 x 480
P4BCI		In-Line	
P4BC1.3R		Right-Angle	1280 x 1024
P4BC1.3I		In-Line	

P4 with Simplified Tool Set Basic Kits

Basic kits include a sensor, bracket, cable, CD-ROM and quick start guide.

Sensor	Tools	Resolution	Housing	Cable Length
P 4	**A**		**R K**	**0 6**
	A = AREA **G** = GEO **E** = EDGE **BC** = BCR	**Blank** = Standard Version **1.3** = 1.3 Megapixel Resolution	**RK** = Right-Angle Kit **IK** = In-Line Kit	**06** = 2 m **23** = 7 m **32** = 10 m **50** = 16 m **75** = 23 m

*Presence*PLUS® *Pro* Specifications

*Presence*PLUS® *Pro* Controller Specifications	
Supply Voltage and Current	**PPROCTL& PPROCTLBCR:** 10 to 30V dc @ less than 1.5 A (exclusive of load) **PPROCTL1.3, PPROCTL1.3BCR, PPROCTLC & PPROCTLCBCR:** 10 to 30V dc @ less than 1.2 A (exclusive of load)
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Memory	**Storage:** 64 MB **Inspections (jobs):** 999 max.
Input/Output Configuration	NPN (sinking) or PNP (sourcing) software selectable
Output Rating	150 mA max. each output **OFF-state leakage current:** less than 100 µA **ON-state saturation voltage:** **NPN**—less than 1V @ 150 mA **PNP**—greater than V+ -2V
Input Specifications	**NPN: ON**—less than 3V **PNP: ON**—greater than (+V-2)V @ 1 mA max. **OFF-state voltage**—greater than 10V @ 4 mA max. **OFF-state voltage**—less than 3V @ 6 mA max.
Indicators	**6 LED indicators:** Trigger, Ready, Power, Pass, Fail, Error
Display Options	PC or NTSC video (uses 9 m max. BNC cable)
Discrete I/O	1 Trigger IN (pin 3), 1 Strobe OUT (pin 4), 1 Remote TEACH IN (pin 6), 6 Programmable I/O (pins 9-14) 1 Product Change IN (pin 15), 4 Product Select IN (pins 16-19)
Communications	1 RJ-45 Ethernet-connection for running *Presence*PLUS *Pro* software and/or output inspection results 1 RS-232 DB-9 port for running *Presence*PLUS *Pro* software and/or output inspection results
Construction	Steel with black zinc plating
Weight	0.55 kg
Environmental Rating	IEC IP20; NEMA 1
Operating Temperature	0° to +50° C
Relative Humidity	90% (non-condensing)

*Presence*PLUS® *Pro* Camera Specifications	
Imager Resolution	**PPROCAM & PPROCAMS:** 640 x 480 pixels **PPROCAM1.3 & PPROCAM1.3S:** 1280 x 1024 pixels **PPROCAMC & PPROCAMCS:** 752 x 480 pixels
Pixel Size	**PPROCAM & PPROCAMS:** 7.4 x 7.4 µm **PPROCAM1.3 & PPROCAM1.3S:** 6.7 x 6.7 µm **PPROCAMC & PPROCAMCS:** 6.0 x 6.0 µm
Imager Size	**PPROCAM & PPROCAMS:** 4.8 x 3.6 mm, 6 mm diagonal (1/3 inch CCD) **PPROCAM1.3 & PPROCAM1.3S:** 8.6 x 6.9 mm, 11 mm diagonal (2/3 inch CMOS) **PPROCAMC & PPROCAMCS:** 4.5 x 2.9 mm, 5.4 mm diagonal (1/3 inch CMOS)
Levels of Gray Scale or Color	**PPROCAM, PPROCAM1.3, PPROCAMS & PPROCAM1.3S:** 256 Grayscale **PPROCAMC & PPROCAMCS:** 256 Red, Green and Blue
Exposure Time	**PPROCAM & PPROCAMS:** 0.10 to 2830 milliseconds **PPROCAM1.3 & PPROCAM1.3S:** 0.10 to 1670 milliseconds **PPROCAMC & PPROCAMCS:** 0.10 to 1040 milliseconds
Acquisition	**PPROCAM & PPROCAMS:** 48 frames per second max. **PPROCAM1.3 & PPROCAM1.3S:** 18 frames per second max. **PPROCAMC & PPROCAMCS:** 17 frames per second max.
Interface	LVDS
Lens Mount	Standard C-mount (1 inch—32 UN)
Construction	**PPROCAM, PPROCAM1.3 & PPROCAMC:** black anodized aluminum **PPROCAMS, PPROCAM1.3S & PPROCAMCS:** nickel-plated aluminum (Lens covers and ring lights are nickel-plated aluminum with glass or polycarbonate window)
Max. Cable Length	7 m
Weight	**PPROCAM, PPROCAM1.3 & PPROCAMC:** approx. 0.09 kg **PPROCAMS, PPROCAM1.3S & PPROCAMCS:** approx. 0.28 kg **Camera only**—0.28 g, **Camera with cover**—0.35 g, **Camera with ring light**—0.59 g
Environmental Rating	**PPROCAM, PPROCAM1.3 & PPROCAMC:** IEC IP20; NEMA 1 **PPROCAMS, PPROCAM1.3S & PPROCAMCS:** IEC IP68; NEMA 6P
Operating Temperature	0° to +50° C
Relative Humidity	**PPROCAM, PPROCAM1.3 & PPROCAMC:** 90% (non-condensing)

More information online at **bannerengineering.com**

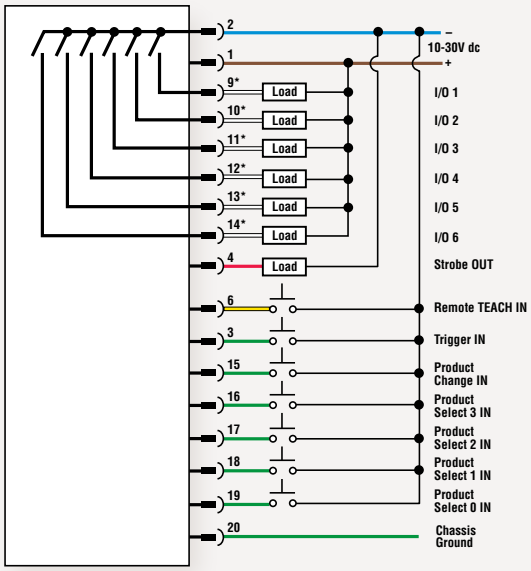
*Presence*PLUS® *P4* Specifications

	*Presence*PLUS® *P4* Specifications
Supply Voltage and Current	10 to 30V dc (24V dc ±10% if the sensor powers a light source) **OMNI, OMNI with BCR & BCR:** less than 650 mA (exclusive of lights and I/O load) **AREA, GEO & EDGE:** less than 500 mA (exclusive of lights and I/O load) **OMNI 1.3, OMNI 1.3 with BCR, COLOR OMNI, COLOR OMNI with BCR, AREA 1.3, GEO 1.3, EDGE 1.3 & BCR 1.3:** less than 550 mA (exclusive of lights and I/O load)
Memory	**Storage: BCR**—8 MB **Inspection (jobs):** 400 max. **AREA, GEO, EDGE**—8 MB **Inspection (jobs):** 500 max. **All others**—32 MB **Inspection (jobs):** 999 max.
Input/Output Configuration	NPN (sinking) or PNP (sourcing) software selectable
Output Rating	150 mA max. each output **OFF-state leakage current:** less than 100 µA **ON-state saturation voltage:** **NPN**—less than 1V @ 150 mA max. **PNP**—greater than V+ -2V
Bicolor Status Indicators	**PASS/FAIL: Green ON steady**—PASS **Red ON steady**—FAIL **POWER/ERROR: Green ON steady**—POWER **Red ON steady**—ERROR **READY/TRIGGER: Green ON steady**—READY **Yellow ON steady**—TRIGGER
Display Options	PC or NTSC video (uses 9 m max. BNC cable)
Discrete I/O	1 Trigger IN 1 Strobe OUT 4 Programmable I/O 1 Product Change IN 1 Remote TEACH IN
Communications	1 RJ-45 10/100 Ethernet connection for running *Presence*PLUS *P4* software and/or output inspection results RS-232 flying leads
Imager Resolution	**OMNI, OMNI with BCR & BCR:** 640 x 480 pixels **OMNI 1.3, OMNI 1.3 with BCR, AREA 1.3, GEO 1.3, EDGE 1.3 & BCR 1.3:** 1280 x 1024 pixels **AREA, GEO & EDGE:** 128 x 100 pixels **COLOR OMNI & COLOR OMNI with BCR:** 752 x 480 pixels
Pixel Size	**OMNI, OMNI with BCR & BCR:** 7.4 x 7.4 µm **OMNI 1.3, OMNI 1.3 with BCR, AREA 1.3, GEO 1.3, EDGE 1.3 & BCR 1.3:** 6.7 x 6.7 µm **AREA, GEO & EDGE:** 20 x 20 µm **COLOR OMNI & COLOR OMNI 1.3:** 6.0 x 6.0 µm
Imager Size	**OMNI, OMNI with BCR & BCR:** 4.8 x 3.6 mm, 6 mm diagonal (1/3 inch CCD) **OMNI 1.3, OMNI 1.3 with BCR, AREA 1.3, GEO 1.3, EDGE 1.3 & BCR 1.3:** 8.6 x 6.9 mm, 11 mm diagonal (2/3 inch CMOS) **AREA, GEO & EDGE:** 2.6 x 2.0 mm, 3.3 mm diagonal (1/5 inch CMOS) **COLOR OMNI & COLOR OMNI with BCR:** 4.5 x 2.9 mm, 5.4 mm diagonal (1/3 inch CMOS)
Levels of Gray Scale or Color	**OMNI, OMNI with BCR, OMNI 1.3, OMNI 1.3 with BCR, AREA, AREA 1.3, GEO, GEO 1.3, EDGE , EDGE 1.3, BCR & BCR 1.3:** 256 Grayscale **COLOR OMNI & COLOR OMNI with BCR:** 256 Red, Green and Blue
Exposure Time	**OMNI, OMNI with BCR & BCR:** 0.1 to 2830 milliseconds **OMNI 1.3, OMNI 1.3 with BCR, AREA 1.3, GEO 1.3, EDGE 1.3 & BCR 1.3:** 0.1 to 1670 milliseconds **AREA, GEO & EDGE:** 0.1 to 20.47 milliseconds **COLOR OMNI & COLOR OMNI with BCR:** 0.1 to 1000 milliseconds
Acquisition	**OMNI, OMNI with BCR & BCR:** 48 frames per second max. **AREA, GEO & EDGE:** 500 frames per second max. **OMNI 1.3, OMNI 1.3 with BCR, AREA 1.3, GEO 1.3, EDGE 1.3 & BCR 1.3:** 27 frames per second max. **COLOR OMNI & COLOR OMNI with BCR:** 17 frames per second max.
Lens Mount	Standard C-mount (1 inch—32 UN)
Construction	Black anodized aluminum housing, glass lens
Weight	Approx. 0.29 kg
Environmental Rating	IEC IP20; NEMA 1
Operating Temperature	0° to +50° C
Relative Humidity	90% (non-condensing)

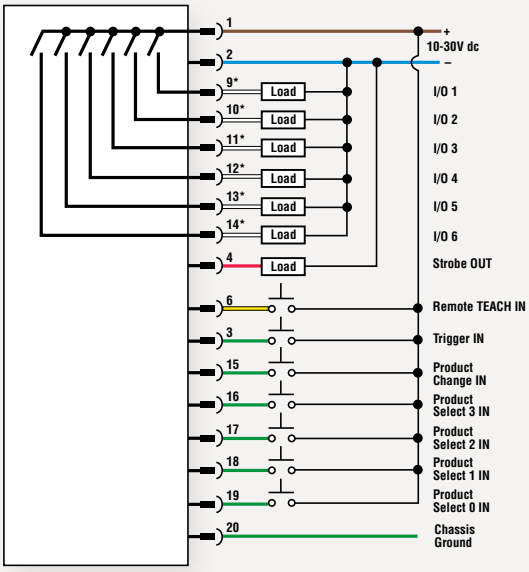
*Presence*PLUS® *Pro* Hookups & Dimensions

Pro Hookup Diagrams

NPN Outputs with NPN Inputs†



PNP Outputs with PNP Inputs†

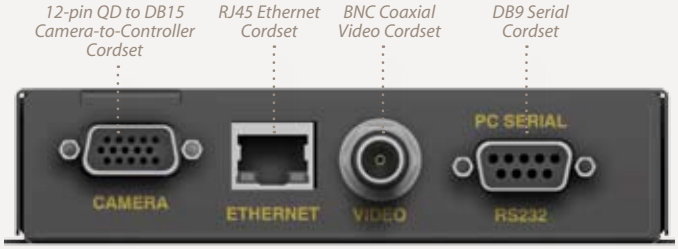


Key

1 = Brown
2 = Blue
3 = Green
4 = Red
5 = Yellow**
6 = Yellow
7 = Yellow**
8 = Yellow**
9 = White*
10 = White*
11 = White*
12 = White*
13 = White*
14 = White*
15 = Green
16 = Green
17 = Green
18 = Green
19 = Green
20 = Green

† Inputs can be either NPN or PNP.
* Can be independently configured as an output or input.
** Not used

Connection Points



Terminal Diagram

Dimension Drawings

MORE INFO ONLINE Detailed Dimensions

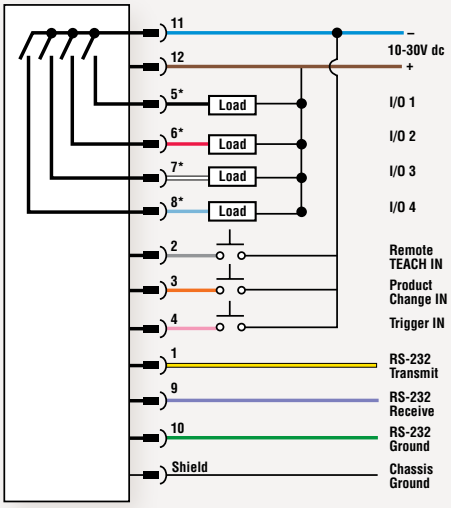
Controller Models

Camera Models
(Shown with lens—sold seperately)

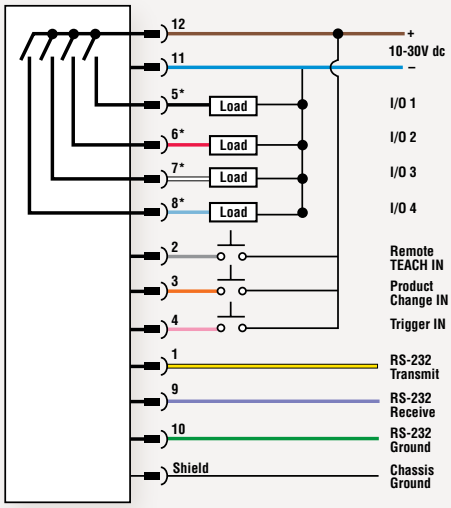
Sealed Camera Models
(Shown with cover)

P4 Hookup Diagrams

NPN Outputs with NPN Inputs†



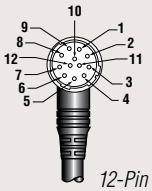
PNP Outputs with PNP Inputs†



† Inputs can be either NPN or PNP.
* Can be independently configured as an output or input.

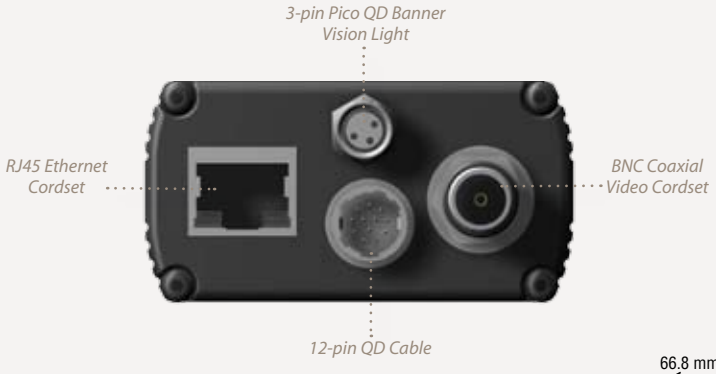
Key

1 = Yellow
2 = Gray
3 = Orange
4 = Pink
5 = Black*
6 = Red*
7 = White*
8 = Light Blue*
9 = Purple
10 = Green
11 = Blue
12 = Brown
Shield = Bare Metal



12-Pin QD

Connection Points



Dimension Drawings

MORE INFO ONLINE
Detailed Dimensions

Right-Angle Sensor Models
(Shown with lens—sold separately)

In-Line Sensor Models
(Shown with lens—sold separately)

Light

See page 31

- Maintenance free, rugged LED lighting in red, green, blue, white and infrared
- Ring lights, area lights, backlights, on-axis lights and speciality lights for tough-to-light objects
- Models for direct connection to sensors or external power supply

Lens

See page 39

- 4-75 mm standard C-mount lenses
- 3.5-75 mm high-performance lenses for less image distortion and greater depth of field
- 8-50 mm megapixel lenses for extraordinary resolution
- Focus locking on most models

Vision Sensing System Selection and Integration. Banner Makes it Easy. And Affordable.

The processing power, sophisticated technology and innovation of compact, affordable Banner *Presence*PLUS® vision sensors make possible high-speed inspection, measurement, sorting and quality control capabilities that were once possible only with sensor arrays or costly, complex machine vision systems. The flexibility and low cost of *Presence*PLUS vision sensors let manufacturers place more sensors in more inspection points to detect defective parts before they become rejected—and costly—assemblies at the end of the production line.

With Ethernet, serial and flexible discrete I/O in every *Presence*PLUS sensor, Windows® based GUI and easy-to-apply inspection tools, integrating a vision system into an existing manufacturing environment no longer requires reconfiguration, wiring runs or significant downtime.

*Presence*PLUS *P4* dedicated-function vision sensors, with lenses and lighting, economically and effectively solve a host of common inspection, measurement, identification and presence applications with plug-and-play simplicity. High-resolution models offer 1.3 megapixel imaging for more detailed inspections of large areas. For more complex or demanding applications, *Presence*PLUS *P4* OMNI and *Presence*PLUS *Pro* full-feature vision sensors offer additional location, vision and analysis tools and I/O—plus color and sealed models. Combined with lighting options, highest quality optics and versatile fixturing solutions, there is a *Presence*PLUS vision sensor to handle your most demanding applications at a fraction of the cost of a conventional machine vision system.

Bracket/Enclosure
See page 40

- A wide selection of specialized brackets, fixtures and mounting systems
- Models for *Pro* and *P4* sensors and Banner lighting
- Enclosures for sensors and lights

Display/Indicators
See page 43

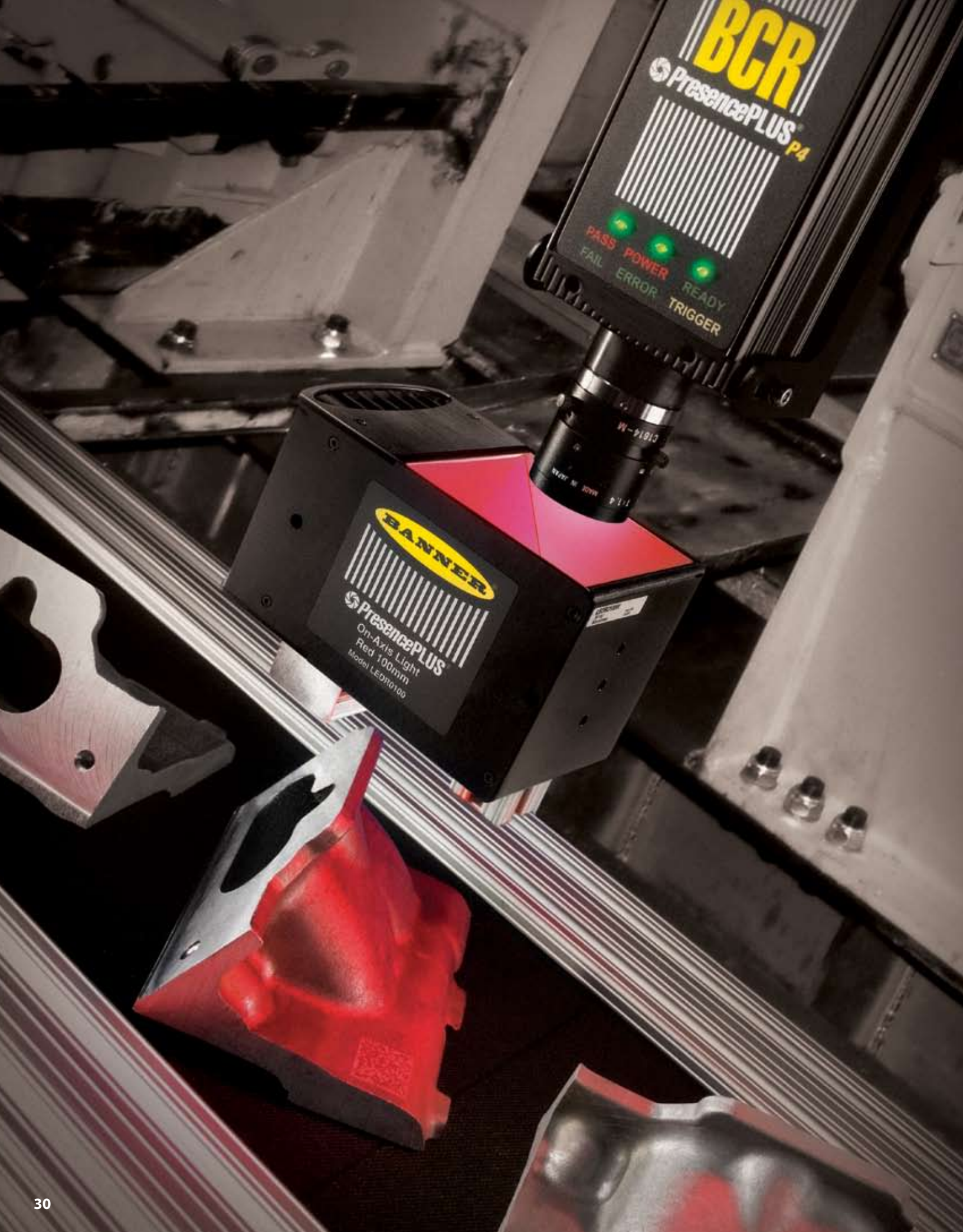
- Live video output for enhanced inspection visibility during setup and/or operation
- Black and white, or color monitors for displaying images
- Indicators for clear indication of part status

Cable
See page 44

- Cables for sensors, cameras, video, serial and Ethernet connections
- Splitter cable for powering two lights from one *P4* sensor
- High-flex cables for robotic applications

Interface Module
See page 46

- Simplify wiring of *P4* sensors in an electrical panel
- Provide repeatable control of strobed lights
- Interface between hardware and *Presence*PLUS sensors or lighting

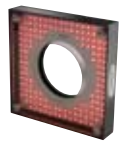

BCR
PresencePLUS P4
PASS
POWER
FAIL
ERROR
READY
TRIGGER
BANNER
PresencePLUS
On-Axis Light
Red 100mm

An Illuminating Look at the Critical Role of Lighting in Successful Vision Sensing.

No matter how powerful or robust a sensor is, successfully meeting challenging vision applications relies heavily on matching the vision sensor with appropriate lighting. Lighting sources, geometry and techniques need to be optimized to the target's optical properties. While contrast is critical, target size, speed, working distance, topography, color, and likelihood of defects are among the other considerations.

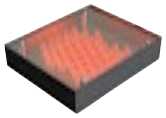
The choices in lighting optics, color filters, diffusers and focusing elements are as varied as the choices of light sources, which include LEDs, fluorescents, lasers, and incandescent halogens or xenons. Lighting is essential to any successful vision sensing system.

Fortunately, Banner offers one of the industry's most extensive selection of lighting solutions for vision sensing, plus the knowledge, personnel and experience to create an integrated solution that delivers reliable performance at desired speeds. Banner's lighting selection and accessories provide single-source convenience and support for matching a sensor and illumination. For the most challenging applications, Banner engineers will work with your sample parts to design an integrated optimal solution.



Ring Light (see page 32)
Mounts directly to the sensor for easy setup and illuminates any object directly in front of the sensor

Backlight (see page 33)
Installs behind the target, directly facing the sensor; has a highly diffused surface and uniform brightness, with a lower intensity than other lights



Area Light (see page 34)
Provides even illumination in a concentrated area

Spot Light (see page 35)
Provides even illumination in a small concentrated spot

Linear Array Light (see page 35)
Provides high-intensity illumination of large areas, at long distances

Tubular Fluorescent Light (see page 35)
Features flicker-free high-intensity illumination of large areas

On-Axis Light (see page 36)
Provides collimated illumination in same optical path as camera

Highly Diffused Light (see page 36)
Softly illuminates from multiple directions, minimizing glare and shadows

Low-Angle Ring Light (see page 37)
Illuminates nearly perpendicular to the direction of an inspection, enhancing the contrast of surface features

Multi-Light (see page 37)
Has independently adjustable light intensity on each axis

Structured Light (see page 37)
Uses laser emitter with extra bright light for 3-dimensional sensing

*Presence*PLUS® Ring Lights

- Brightly illuminates smaller objects
- Centers the light on the image
- Mounts directly to the camera

*Presence*PLUS® *Pro* LED Ring Lights

Voltage: **24V dc**

Size†	Model	Description	Connection*	Data Sheet
80 x 80 mm	LEDRR80X80W	Red	2 m	108626
	LEDWR80X80W	White		
	LEDBR80X80W	Blue		
	LEDGR80X80W	Green		
	LEDIR80X80W	Infrared		
62 x 62 mm	LEDRR62X62W	Red	2 m	108626
	LEDWR62X62W	White		
	LEDBR62X62W	Blue		
	LEDGR62X62W	Green		
	LEDIR62X62W	Infrared		

*For 9 m cable, add suffix **W/30** to the 2 m model number (example, **LEDRR80X80W W/30**).
† For replacement windows and diffusers (see page 38).

*Presence*PLUS® *P4* LED Ring Lights

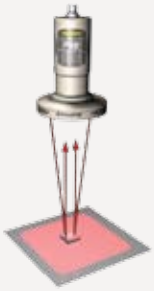
Voltage: **24V dc**

Size†	Model	Description	Connection*	Data Sheet
80 x 80 mm	LEDRR80X80M	Red	0.3 m Threaded 3-pin Pico pigtail QD	116941
	LEDWR80X80M	White		
	LEDBR80X80M	Blue		
	LEDGR80X80M	Green		
	LEDIR80X80M	Infrared		
62 x 62 mm	LEDRR62X62M	Red	0.3 m Threaded 3-pin Pico pigtail QD	116941
	LEDWR62X62M	White		
	LEDBR62X62M	Blue		
	LEDGR62X62M	Green		
	LEDIR62X62M	Infrared		

*Splitter cable available for powering two lights (see page 45).
† For replacement windows and diffusers (see page 38).

Sealed *Presence*PLUS® *Pro* LED Ring Lights

Voltage: **24V dc**



Size	Model	Window	Description	Connection	Data Sheet
90 mm dia.	LEDRR90S-P	Plastic	Red	3-pin Pico QD	128842
	LEDRR90S-G	Glass			
	LEDWR90S-P	Plastic	White		
	LEDWR90S-G	Glass			
	LEDBR90S-P	Plastic	Blue		
	LEDBR90S-G	Glass			
	LEDGR90S-P	Plastic	Green		
	LEDGR90S-G	Glass			
	LEDIR90S-P	Plastic	Infrared		
	LEDIR90S-G	Glass			

Specialty Ring Lights

Size	Model	Description	Data Sheet
100 mm dia.	HFFW5100	110V ac Fluorescent	115969
	HFFW5100A220	220V ac Fluorescent	115970
	HFFBB	110V ac UV Fluorescent	115968

RFLBB UV fluorescent ring lamp replacement bulb, **RFLW5100** fluorescent ring lamp replacement bulb.
NOTE: Specialty lights are not stocked and are non-returnable.

*Presence*PLUS® Backlights

- Determines the shape and size of target objects
- Provides the most robust lighting for measuring and gauging
- Highlights through-holes in target objects

LED Backlights

Voltage: **24V dc**

Illumination Area†	Model	Description	Connection*	Data Sheet
70 x 70 mm	**LEDRB70X70W**	**Red**	2 m	115349
	LEDRB70X70M		2 m Threaded 3-pin Pico pigtail QD	116947
	LEDIB70X70W	**Infrared**	2 m	115349
	LEDIB70X70M		2 m Threaded 3-pin Pico pigtail QD	116947
85 x 220 mm	**LEDRB85X220W**	**Red**	2 m	115349
	LEDRB85X220M		2 m Threaded 3-pin Pico pigtail QD	116947
	LEDIB85X220W	**Infrared**	2 m	115349
	LEDIB85X220M		2 m Threaded 3-pin Pico pigtail QD	116947

*For 9 m cable, add suffix **W/30** to the 2 m model number (example, **LEDRB70X70W W/30**). QD models can be connected directly to *P4* sensors; splitter cables available for powering two lights (see page 45).

† For replacement windows and diffusers (see page 38).

Specialty LED Backlights

Voltage: **12V dc**

Illumination Area	Model	Description	Connection*	Data Sheet
50 x 50 mm	**LEDRB50X50N**	**Red** diffused	1.8 m with 9-pin D-sub connector	67426
	LEDWB50X50N	White diffused		
	LEDBB50X50N	**Blue** diffused		
	LEDIB50X50N	**Infrared** diffused		
75 x 75 mm	**LEDRB75X75N**	**Red** diffused		67427
	LEDWB75X75N	White diffused		
	LEDBB75X75N	**Blue** diffused		
	LEDIB75X75N	**Infrared** diffused		
100 x 100 mm	**LEDRB100X100N**	**Red** diffused		67428
	LEDWB100X100N	White diffused		
	LEDBB100X100N	**Blue** diffused		
	LEDIB100X100N	**Infrared** diffused		
50 x 200 mm	**LEDRB50X200N**	**Red** diffused		67429
	LEDRB50X200N-H	**Red** diffused, high output		67430
	LEDRB50X200N-NH	**Red** non-diffused, high output		
100 x 200 mm	**LEDRB100X200N**	**Red** diffused		67431
	LEDIB100X200N	**Infrared** diffused		

*Specialty lights are not stocked and are non-returnable; they require an external power supply (see page 46).

*Presence*PLUS® Area Lights

- Illuminates specific surface angles
- Reflects glare from shiny surfaces away from camera
- Creates shadows to detect changes in depth

LED Area Lights

Voltage: **24V dc**

Size†	Model	Description	Connection*	Data Sheet
80 x 80 mm	**LEDRA80X80W**	**Red**	2 m	115607
	LEDRA80X80M		2 m Threaded 3-pin Pico pigtail QD	116949
	LEDWA80X80W	**White**	2 m	115607
	LEDWA80X80M		2 m Threaded 3-pin Pico pigtail QD	116949
	LEDBA80X80W	**Blue**	2 m	115607
	LEDBA80X80M		2 m Threaded 3-pin Pico pigtail QD	116949
	LEDGA80X80W	**Green**	2 m	115607
	LEDGA80X80M		2 m Threaded 3-pin Pico pigtail QD	116949
	LEDIA80X80W	**Infrared**	2 m	115607
	LEDIA80X80M		2 m Threaded 3-pin Pico pigtail QD	116949
62 x 62 mm	**LEDRA62X62W**	**Red**	2 m	121779
	LEDRA62X62M		2 m Threaded 3-pin Pico pigtail QD	121780
	LEDWA62X62W	**White**	2 m	121779
	LEDWA62X62M		2 m Threaded 3-pin Pico pigtail QD	121780
	LEDBA62X62W	**Blue**	2 m	121779
	LEDBA62X62M		2 m Threaded 3-pin Pico pigtail QD	121780
	LEDGA62X62W	**Green**	2 m	121779
	LEDGA62X62M		2 m Threaded 3-pin Pico pigtail QD	121780
	LEDIA62X62W	**Infrared**	2 m	121779
	LEDIA62X62M		2 m Threaded 3-pin Pico pigtail QD	121780

* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **LEDRA80X80W W/30**). QD models can be connected directly to *P4* sensors; splitter cables available for powering two lights (see page 45).
† For replacement windows and diffusers (see page 38).

Specialty LED Area Lights

Voltage: **12V dc**

Size	Model	Description	Connection*	Data Sheet
50 x 50 mm	**LEDRA50X50N**	**Red**	1.8 m with 9-pin D-sub connector	67423
	LEDWA50X50N	**White**		
	LEDBA50X50N	**Blue**		
	LEDIA50X50N	**Infrared**		
75 x 75 mm	**LEDRA75X75N**	**Red**		67424
	LEDWA75X75N	**White**		
	LEDBA75X75N	**Blue**		
	LEDIA75X75N	**Infrared**		
100 x 100 mm	**LEDRA100X100N**	**Red**		67425
	LEDWA100X100N	**White**		
	LEDBA100X100N	**Blue**		
	LEDIA100X100N	**Infrared**		

*Specialty lights are not stocked and are non-returnable; they require an external power supply (see page 46).

*Presence*PLUS® Spot Lights

- Provides off-axis illumination of small areas
- Withstands washdown (rated IP67)

Sealed LED Spot Lights

Voltage: **10 to 30V dc**

Size	Model	Description	Connection*	Data Sheet
30 mm	**LEDRSW**	Red	2 m	122987
	LEDRSM		2 m Threaded 3-pin Pico pigtail QD	122986
	LEDWSW	White	2 m	122987
	LEDWSM		2 m Threaded 3-pin Pico pigtail QD	122986
	LEDBSW	Blue	2 m	122987
	LEDBSM		2 m Threaded 3-pin Pico pigtail QD	122986
	LEDGSW	Green	2 m	122987
	LEDGSM		2 m Threaded 3-pin Pico pigtail QD	122986

* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **LEDRSW W/30**). QD models can be connected directly to *P4* sensors; splitter cables available for powering two lights (see page 45).

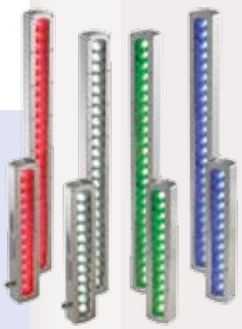
*Presence*PLUS® Linear Array Lights

- Maintenance-free LED illumination of large objects from far away
- Provides super high-intensity illumination of large areas
- Withstands washdown (rated IP68)

Sealed LED Linear Array Lights

Voltage: **24V dc**

Length†	Model	Window	Description	Connection*	Data Sheet
12"	**LEDRLA290S-P**	Plastic	Red	0.15 m Threaded 4-pin Euro pigtail QD	127725
	LEDRLA290S-G	Glass			
	LEDWLA290S-P	Plastic	White		
	LEDWLA290S-G	Glass			
	LEDBLA290S-P	Plastic	Blue		
	LEDBLA290S-G	Glass			
	LEDGLA290S-P	Plastic	Green		
	LEDGLA290S-G	Glass			
24"	**LEDRLA580S-P**	Plastic	Red	0.15 m Threaded 4-pin Euro pigtail QD	127725
	LEDRLA580S-G	Glass			
	LEDWLA580S-P	Plastic	White		
	LEDWLA580S-G	Glass			
	LEDBLA580S-P	Plastic	Blue		
	LEDBLA580S-G	Glass			
	LEDGLA580S-P	Plastic	Green		
	LEDGLA580S-G	Glass			



* Splitter cable available for powering two lights (see page 45).
† For replacement windows (see page 38).

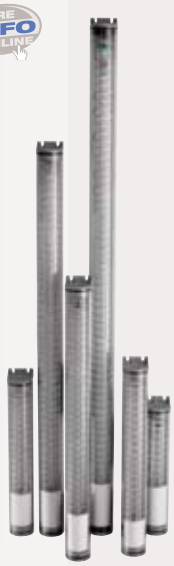
*Presence*PLUS® Tubular Lights

- Provides easy, affordable, flicker-free illumination of large objects
- Uses waterproof housings (rated IP67) with integrated mounting brackets

Sealed Flourescent Tubular Lights

Voltage: **Varies**

Length	Model	Voltage	Ballast	Data Sheet
8"	**HFFW8DC**	24V dc	Integral	115387
8"	**HFFW8AC110**	110V ac		
8"	**HFFW8AC230**	230V ac		
12"	**HFFW12DC**	24V dc		
12"	**HFFW12AC**	120 to 277V ac		
14"	**HFFW14DC**	24V dc		
15"	**HFFW15AC110**	110V ac		
15"	**HFFW15AC230**	230V ac		
24"	**HFFW24AC**	120 to 277V ac		
36"	**HFFW36AC**	120 to 277V ac		
48"	**HFFW48AC**	120 to 277V ac		
8"	**HFFW8ACR**	120 to 277V ac	Remote	115387
12"	**HFFW12ACR**	120 to 277V ac		
15"	**HFFW15ACR**	120 to 277V ac		
24"	**HFFW24ACR**	120 to 277V ac		
36"	**HFFW36ACR**	120 to 277V ac		
48"	**HFFW48ACR**	120 to 277V ac		



Note: Replacement bulbs available, contact factory for information. All models have louvers and integral mounting flange; optional brackets are available for heavy-duty mounting (two brackets required for each light, see page 41).

*Presence*PLUS® On-Axis Lights

- Provides more uniform illumination than a ring light
- Delivers collimated illumination in same optical path as camera
- Evenly illuminates on flat reflective material

LED On-Axis Lights

Voltage: **24V dc**

Size	Model	Description	Connection*	Data Sheet
100 x 100 mm	**LEDRO100W**	**Red**	2 m	126059
	LEDRO100M		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDRO100W-D	**Red**, w/dust cover	2 m	
	LEDRO100M-D		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDWO100W	White	2 m	
	LEDWO100M		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDWO100W-D	White, w/dust cover	2 m	
	LEDWO100M-D		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDBO100W	**Blue**	2 m	
	LEDBO100M		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDBO100W-D	**Blue**, w/dust cover	2 m	
	LEDBO100M-D		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDGO100W	**Green**	2 m	
	LEDGO100M		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDGO100W-D	**Green**, w/dust cover	2 m	
	LEDGO100M-D		0.6 m Threaded 3-pin Pico pigtail QD	
	LEDIO100W	Infrared	2 m	
	LEDIO100M		0.6 m Threaded 3-pin Pico pigtail QD	

* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **LEDRO100W W/30**).
QD models can be connected directly to *P4* sensors.

Specialty LED On-Axis Lights

Voltage: **12V dc**

Size	Model	Description	Connection*	Data Sheet
25 mm dia.	**LEDRO25N**	**Red**	0.5 m with 9-pin D-sub connector	67437
	LEDWO25N	White		
	LEDBO25N	**Blue**		
50 mm dia.	**LEDRO50N**	**Red**	2 m with 9-pin D-sub connector	67438
	LEDRO50N-D	**Red**, w/dust cover		
	LEDWO50N	White		
	LEDBO50N	**Blue**		
	LEDIO50N	Infrared		
75 mm dia.	**LEDRO75N**	**Red**	0.5 m with 9-pin D-sub connector	67439
	LEDRO75N-H	**Red**, high output		
	LEDWO75N	White		
	LEDBO75N	**Blue**		

* Specialty lights are not stocked and are non-returnable; they require an external power supply (see page 46).

*Presence*PLUS® Highly Diffused Lights

- Minimizes glare and shadows
- Illuminates curved surfaces softly and evenly
- Minimizes texture

Specialty LED Highly Diffused Lights

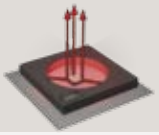
Voltage: **12V dc**

Size	Model	Description	Connection*	Data Sheet
150 mm dia.	**LEDRD150N**	**Red**, dome	1.8 m with 9-pin D-sub connector	66955
25 mm dia.	**LEDRS25N**	**Red**	0.5 m with 9-pin D-sub connector	67441
75 mm dia.	**LEDRS75N**	**Red**		67442
	LEDGS75N	**Green**		

* Specialty lights are not stocked and are non-returnable; they require an external power supply (see page 46).

*Presence*PLUS® Low-Angle Ring Lights

- Highlights surface irregularities
- Highlights changes in elevation
- Illuminates from an angle nearly perpendicular to object



LED Low-Angle Ring Lights

Voltage: **24V dc**

Size	Model	Description	Connection*	Data Sheet
150 mm dia.	**LEDRI150-3W**	Red	2 m	127582
	LEDII150-3M		2 m Threaded 3-pin Pico pigtail QD	
	LEDII150-3W	Infrared	2 m	
	LEDII150-3M		2 m Threaded 3-pin Pico pigtail QD	

* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **LEDRI150-3W W/30**). QD models can be connected directly to *P4* sensors.

Specialty LED Low-Angle Ring Lights

Voltage: **12V dc**

Size	Model	Description	Connection*	Data Sheet
100 mm dia.	**LEDRI100N**	Red	1.8 m with 9-pin D-sub connector	67432

* Specialty lights are not stocked and are non-returnable; they require an external power supply (see page 46).

*Presence*PLUS® Multi-Lights

- Provides multiple lighting angles and highly diffused lighting

Specialty LED Multi-Lights

Voltage: **12V dc**

Size	Model	Description	Connection*	Data Sheet
50 mm dia.	**LEDRM50N**	Red low-angle & on-axis	1.8 m with 9-pin D-sub connector	67435
	LEDRM50N-H	Red low-angle & on-axis, high output		
75 mm dia.	**LEDRM75N**	Red low-angle & on-axis		67436
150 mm dia.	**LEDRC150N**	Red low-angle & on-axis multi-light		67443
200 mm dia.	**LEDRC200N**	Red low-angle & on-axis multi-light		67444

NOTE: Specialty lights are not stocked and are non-returnable; they require an external power supply (see page 46).

Laser Emitters for Structured Illumination

- Provides high-contrast illumination
- Senses surface height differences
- Provides 3D inspection with a 2D camera

QS18 Laser Emitters

Voltage: **10 to 30V dc**

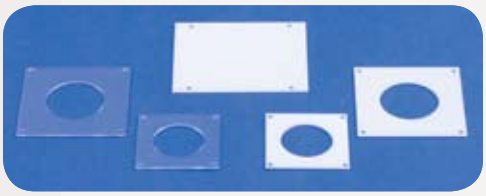
Model	Description	Connection*	Data Sheet
QS186LE212	Extra Bright Horizontal Line (Class 2)	2 m	109415

* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **QS186LE212 W/30**).

*Presence*PLUS® Lighting Accessories

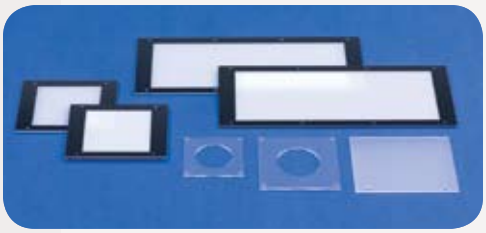
- Filters and diffusers for blocking light and improving lighting quality
- Window replacements for *Presence*PLUS Ring Lights, Area Lights, Backlights and Linear Array Lights

Lighting Diffusers



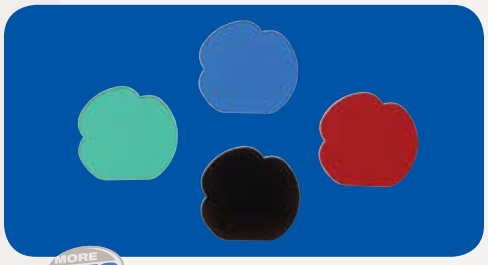
Model	Description	Use With
LEDRDW	White Diffusing Window Kit	80 x 80 mm Ring Lights
LEDRCDW	Clear Diffusing Window Kit	80 x 80 mm Ring Lights
LEDRDWS	White Diffusing Window Kit	62 x 62 mm Ring Lights
LEDRCDWS	Clear Diffusing Window Kit	62 x 62 mm Ring Lights
LEDADW	White Diffusing Window Kit	80 x 80 mm Area Lights
LEDADWS	White Diffusing Window Kit	62 x 62 mm Area Lights

Window Replacements



Model	Description	Use With
LEDRCW	Clear Plastic Window Replacement	80 x 80 mm Ring Lights
LEDRCWS		62 x 62 mm Ring Lights
LEDAW		80 x 80 mm Area Lights
LEDAWS		62 x 62 mm Area Lights
LEDLA290SW-P		12" Sealed Linear Array Lights
LEDLA580SW-P		24" Sealed Linear Array Lights
LEDLA290SW-G	Clear Glass Window Replacement	12" Sealed Linear Array Lights
LEDLA580SW-G		24" Sealed Linear Array Lights
LEDBW	White Window Replacement	70 x 70 mm Red Backlights
LEDBIW		70 x 70 mm Infrared Backlights
LEDBWL		85 x 220 mm Red Backlights
LEDBIWL		85 x 220 mm Infrared Backlights

Filters



MORE INFO ONLINE

Choosing a Filter

Model	Color	Description	Data Sheet
FLTI	Infrared (≥ 760 nm)	High-pass filter blocks visible light and passes infrared light. Included with all Banner Infrared light sources.	69461
FLTB	Blue (400-525 nm)	Band-pass filter improves quality by helping to reduce ambient light; it passes blue and infrared light.	115635
FLTG	Green (400-575 nm)	Band-pass filter improves quality by helping to reduce ambient light; it passes green and infrared light.	115634
FLTR	Red (≥ 600 nm)	High-pass filter improves quality by helping to reduce ambient light; it passes red and infrared light	69628
LEDRRPFK	—	Polarizing filter kit for 80 x 80 Ring Lights	108945
LEDRRPFKS	—	Polarizing filter kit for 62 x 62 Ring Lights	108945
LEDAPFK	—	Polarizing filter kit for 80 x 80 Area Lights and 70 x 70 Backlights	113657
LEDAPFKS	—	Polarizing filter kit for 62 x 62 Area Lights	113657
LEDRPFK90	—	Polarizing filter kit for Sealed Ring Lights	129871
LEDFLTK	—	Kit with a variety of filters, diffusers and window replacements	—

*Presence*PLUS® Lenses

- Wide choice of C-mount lenses for desired field of view at extended distances
- Standard, high-performance and megapixel lenses for extraordinary performance
- Models with focus and aperture locking

MORE INFO ONLINE Choosing a Lens

*Presence*PLUS® Standard Lenses

Sensor Models: **All** (except 1.3 megapixel models)

Model	Description	Format Size
LCF04	4 mm Lens	1/3"
LCF08	8 mm Lens	
LCF12	12 mm Lens with Focus Locking	
LCF16	16 mm Lens with Focus Locking	
LCF25R	25 mm Lens with Focus and Aperture	1"
LCF25LR	25 mm Lens with Focus and Aperture Locking, Metal Housing	
LCF50L1R*	50 mm Lens with Focus and Aperture Locking	2/3"
LCF50L2R*	50 mm Lens with Focus and Aperture Locking, Metal Housing	1"
LCF75LR*	75 mm Lens with Focus and Aperture Locking, Metal Housing	
LEK	C-mount Lens Extension Kit (0.5, 1.0, 5.0, 10, 20 and 40 mm)	—
LEKS	C-mount Lens Extension Kit (0.25, and 0.5 mm)	

*Presence*PLUS® High-Performance Lenses

Sensor Models: **All** (except 1.3 megapixel models)

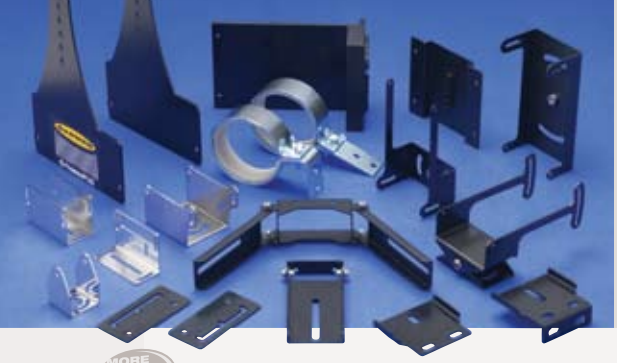
Model	Description	Format Size
LCF03LT	3.5 mm Lens with Focus and Aperture Locking	1/2"
LCF1040LT*	10 - 40 mm Lens with Zoom, and Focus and Aperture Locking	
LCF06LT	6.5 mm Lens with Focus and Aperture Locking	2/3"
LCF08LT	8 mm Lens with Focus and Aperture Locking	
LCF12LT	12 mm Lens with Focus and Aperture Locking	
LCF16LT	16 mm Lens with Focus and Aperture Locking	
LCF25LT	25 mm Lens with Focus and Aperture Locking	
LCF50LT	50 mm Lens with Focus and Aperture Locking	
LCF75LT	75 mm Lens with Focus and Aperture Locking	
FLTUV	UV Lens Filter, Clear Glass	
LEK	C-mount Lens Extension Kit (0.5, 1.0, 5.0, 10, 20 and 40 mm)	—
LEKS	C-mount Lens Extension Kit (0.25 and 0.5 mm)	

*Presence*PLUS® Megapixel Lenses

Sensor Models: **All**

Model	Description	Format Size
LCF08LMP	8 mm Lens with Focus and Aperture Locking	2/3"
LCF12LMP	12 mm Lens with Focus and Aperture Locking	
LCF16LMP	16 mm Lens with Focus and Aperture Locking	
LCF25LMP	25 mm Lens with Focus and Aperture Locking	
LCF35LMP	35 mm Lens with Focus and Aperture Locking	
LCF50LMP	50 mm Lens with Focus and Aperture Locking	
LEK	C-mount Lens Extension Kit (0.5, 1.0, 5.0, 10, 20 and 40 mm)	—
LEKS	C-mount Lens Extension Kit (0.25 and 0.5 mm)	

*Lens models will not fit in opening of Banner Ring Lights.



*Presence*PLUS® *Pro & P4* Brackets

MORE INFO ONLINE
Brackets

*Presence*PLUS® *Pro*

Camera

SMBPPLU
Highly stable U-shaped long bracket

SMBPPRA
Right-angle bracket with single-side mounting for difficult-to-access sites

SMBPPU
U-shaped swivel bracket

*Presence*PLUS® *Pro*

Controller

SMBPPDH
DIN-rail flat mounting for easy viewing of LEDs

SMBPPDE
DIN-rail edge mounting bracket to save linear track space

Sealed *Presence*PLUS® *Pro*

SMBPPSU
Swivel bracket for sealed *Pro*

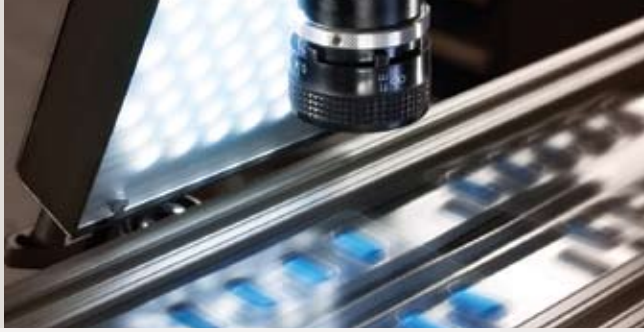
*Presence*PLUS® *P4*

Right-Angle

SMBP4RAB
Heavy-duty bracket for right-angle *P4*

SMBP4RAS
Swivel bracket for right-angle *P4*

*Presence*PLUS® Lighting Brackets



Area Lights

80 x 80

SMBABM
Surface-mount bracket for mounting light from front

SMBACM*
Column-mount bracket with locking pivot

SMBP4ASM*
For mounting one area light to the *P4* housing

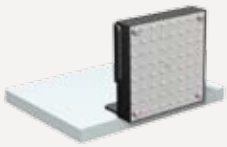
SMBP42ASM**
For mounting two area lights to *P4* housing

62 x 62

SMBP4ASM
For mounting one area light to the *P4* housing

SMBP42ASM
For mounting two area lights to *P4* housing

SMBVLA62X62S
Surface-mount bracket for mounting light from front



SMBVLA62X62RA
For mounting an area light at a right angle

Backlights

70 x 70

SMBABM
Surface-mount bracket for mounting light from front

SMBACM*
Column-mount bracket with locking pivot

Tubular Fluorescent Lights

SMBWFTLS
In-line bracket

SMBWFTLR
Right-angle bracket

Spot Light

SMBP4ASM
For mounting one spot light light to the *P4* housing

SMBP42ASM
For mounting two spot lights to *P4* housing

SMBPPLK
2" pivoting knuckle assembly for spot light

On-Axis Lights

SMBP4OAL
For mounting on-axis light to *P4* housing

** Shown with optional SMBPPK6 mounting kit (see page 42).*
*** Requires one SMBACM bracket with each light.*

*Presence*PLUS® Mounting Systems & Enclosures

- Heavy-duty enclosure kits for protection of sensors and lights
- Adjustable mounting systems for flexible positioning of sensors and lights

Adjustable Mounting Systems

SMBPPLK

SMBPPK6 SMBPPK3

SMBPPF1 & SMBPPFB

Model	Description	Used With
SMBPPK3	3" Column, Base, and Knuckle Kit	*Pro, P4,* Lights
SMBPPK6	6" Column, Base, and Knuckle Kit	
SMBPPK	Mounting Bracket Knuckle	
SMBPPKE3	3" Column	
SMBPPKE6	6" Column	
SMBPPKB	Mounting Bracket Base	
SMBPPLK	2" Mounting Knuckle Assembly	
SMBPPF1	Bogen Arm with Single Knob	
SMBPPFB	Bogen Arm Clamp	

Enclosure Kits

Model P4RE67-G

Model PPE-G

Model PPE4-G

Model	Description	Data Sheet
P4RE67-G	Heavy-duty stainless-steel enclosure kit for *Presence*PLUS *P4* right-angle sensor and ring light - glass viewport; NEMA 6 rated	121996
P4RE67-P	Heavy-duty stainless-steel enclosure kit for *Presence*PLUS *P4* right-angle sensor and ring light - polycarbonate viewport; NEMA 6 rated	
PPE-G	Heavy-duty cold-rolled steel industrial protection kit for *Presence*PLUS *Pro* camera and lens - glass viewport; NEMA 1 rated	115342
PPE-P	Heavy-duty cold-rolled steel industrial protection kit for *Presence*PLUS *Pro* camera and lens - polycarbonate viewport; NEMA 1 rated	
PPE-RG	*Presence*PLUS *Pro* camera enclosure and industrial protection kit replacement glass viewport	None
PPE-RP	*Presence*PLUS *Pro* camera enclosure and industrial protection kit replacement polycarbonate plastic viewport	
PPE4-G	Heavy-duty stainless-steel enclosure kit for *Presence*PLUS *Pro* camera and ring light - glass viewport; NEMA 4 rated	111362
PPE4-P	Heavy-duty stainless-steel enclosure kit for *Presence*PLUS *Pro* camera and ring light - polycarbonate viewport; NEMA 4 rated	
SMBPPES	Mounting bracket, enclosure straight (PPE-P, PPE-G)	None
SMBPPEA	Mounting bracket, enclosure right angle (PPE-P, PPE-G)	
SMBPPEF	Mounting bracket, enclosure front (PPE-P, PPE-G)	

More information online at **bannerengineering.com**

Monitors & Indicator Lights

- Video monitors for easy viewing of inspections in real-time
- EZ-LIGHT™ indicators for clear visual indication of part status

Monitors

Sensor Models: ***Pro, P4***

Model	Description	Data Sheet
PPM9	9" Black and White NTSC Video Monitor	None

*Monitors require a BNC cable for connection to a *Presence*PLUS Sensor (see page 44).

PPM9

Flat Panel Monitor

M18

EZ-LIGHT™ Indicators, Multi-Color, 7-Function

Model	Construction	Connection*	LED Function	Inputs	Data Sheet
M18GRY2PQ	18 mm mount Nickel-plated brass	4-pin Euro QD	Choose Red, Yellow or Green ON, flashing or alternating Other Colors Available	PNP	121902
M18GRY2NQ				NPN	
T30GRY2PQ	30 mm mount Thermoplastic polyester			PNP	
T30GRY2NQ				NPN	
K50LGRY2PQ	30 mm mount Thermoplastic polyester			PNP	
K50LGRY2NQ				NPN	
K80LGRY2PQ	Flat or DIN mount Thermoplastic polyester			PNP	
K80LGRY2NQ				NPN	

T30

K50L

K80L

***K80L Models:** QD models are listed. For terminal wiring option, omit **Q** from model number (example, **K80LGRY2P**). A model with a QD requires a mating cable (see page 45).

Other Models: QD models are listed. For 2 m cable, omit suffix **Q** from model number (example, **M18GRY2P**). A model with a QD requires a mating cable (see page 45).

*Presence*PLUS® Cables & Cordsets

- Cables for sensors, cameras, video, serial and Ethernet connections
- Sealed cables for powering sealed lights and cameras
- High-flex cables for applications requiring articulated or reciprocated motion
- Splitter cable for powering two lights from one *P4* sensor

Pro Camera-to-Controller Cordsets

12-Pin QD to DB15

Sensor Models: ***Pro***

End View	Model	Description	Length	Dimensions
Male QD	PPC06	Male Straight/ Male DB15	2 m	Straight: 55 mm; ø 14.7 mm; ø 9.5 mm
	PPC23		7 m	
	PPC32		10 m	
	PPC06HF	Male Straight (High-Flex)/ Male DB15	2 m	
	PPC23HF		7 m	
	PPC32HF		10 m	
Male DB15	PPC06RA	Male Right-Angle/ Male DB15	2 m	Right-Angle: 37.5 mm; 47.6 mm; ø 14.7 mm; ø 9.5 mm
	PPC10RA		3 m	
	PPC23RA		7 m	
	PPC32RA		10 m	
	PPC06RAHF	Male Right-Angle (High-Flex)/ Male DB15	2 m	
	PPC23RAHF		7 m	
	PPC32RAHF		10 m	

DB15: 50.6 mm; 18 mm; 32.3 mm

12-Pin QD to DB15

Sensor Models: **Sealed *Pro***

End View	Model	Description	Length	Dimensions
Female QD Male DB15	PPC13S	Female Straight/ Male DB15	4 m	Straight: 48.8 mm; ø 13 mm; ø 8 mm
	PPC23S		7 m	
	PPC32S		10 m	

DB15: 50.6 mm; 18 mm; 32.3 mm

P4 Cables & Cordsets

12-Pin QD

Sensor Models: ***P4,*** **PPSIM with terminal strip to *P4***

End View	Model	Description	Length	Dimensions
1 = Yellow 2 = Gray 3 = Orange 4 = Pink 5 = Black* 6 = Red* 7 = White* 8 = Light Blue* 9 = Purple 10 = Green 11 = Blue 12 = Brown Shield = Bare Metal Female QD	P4C06	Female Straight	2 m	Straight: 55 mm; ø 14.7 mm; ø 9.5 mm
	P4C23		7 m	
	P4C32		10 m	
	P4C50		16 m	
	P4C75		23 m	

12-Pin QD to DB15

Sensor Models: ***P4*** **to PPSIM with DB15 connector**

End View	Model	Description	Length	Dimensions
Female QD Male DB15	P4C06SIM	Female Straight/ Male DB15	2 m	Straight: 55 mm; ø 14.7 mm; ø 9.5 mm
	P4C23SIM		7 m	
	P4C32SIM		10 m	

DB15: 52 mm; 26 mm; 39.4 mm

Video Cordsets

BNC Coaxial Cordsets

Sensor Models: ***Pro, P4***

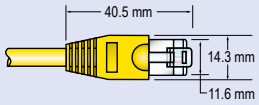
End View	Model	Description	Length	Dimensions
Male	BNC06	Video Coaxial with BNC	2 m	BNC: 16 mm; ø14.5 mm; ø13.6 mm
	BNC15		5 m	
	BNC30		9 m	

More information online at **bannerengineering.com**

Communications Cordsets

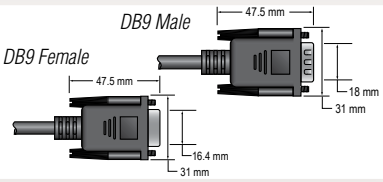
RJ45 Ethernet

Sensor Models: ***Pro, P4***

End View	Model	Description	Length	Dimensions
Male 	**STP07**	Cat5e Shielded	2.1 m	*RJ45* 
	STPX07	Cat5e Crossover Shielded		
	STP25	Cat5e Shielded	7.3 m	
	STPX25	Cat5e Crossover Shielded		
	STPX75	Cat5e Shielded	23 m	

DB9 Serial

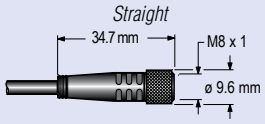
Sensor Models: ***Pro***

End View	Model	Description	Length	Dimensions
Male DB9  Female DB9 	**DB9P06**	Male DB9/ Female DB9	2 m	*DB9 Male* *DB9 Female* 
	DB9P15		5 m	
	DB9P30		9 m	

Light Cables & Cordsets

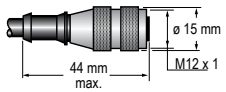
3-Pin Pico QD

Light Models: **Sealed Ring Lights**

End View	Model	Description	Length	Dimensions
Female 1 = Brown 3 = Blue 4 = Black 	**PKG3M-4**	Female Straight	4 m	*Straight* 
	PKG3M-7		7 m	
	PKG3M-10		10 m	

4-Pin Euro QD

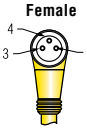
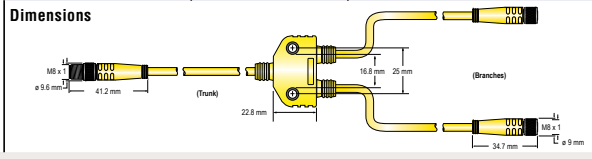
Light Models: **Sealed Linear Array Lights, EZ-LIGHT**

End View	Model	Description	Length	Dimensions
Female 1 = Brown 2 = White 3 = Blue 4 = Black 	**MQDC-406**	Female Straight	2 m	*Straight* 
	MQDC-415		5 m	
	MQDC-430		9 m	

Splitter Cables

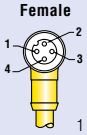
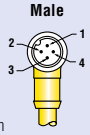
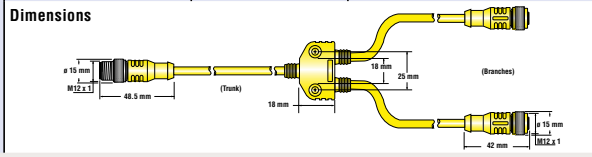
3-Pin Pico Splitters

Light Models: **Ring Lights, Area Lights, Spot Lights and Backlights**

End View	Model	Branches	Trunks
Female  Male  1 = Brown 3 = Blue 4 = Black	**CSB-M831M831**	3-Pin Pico QD 2 x 0.2 m Female	0.2 m Male
Dimensions 			

4-Pin Euro Splitters

Light Models: **Sealed Linear Array Lights, EZ-LIGHT**

End View	Model	Branches	Trunks
Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black	**CSB-M1241M1241**	4-Pin Euro QD 2 x 0.3 m Female	0.3 m Male
	CSB-UNT425M1241		8 m unterminated
Dimensions 			

*Presence*PLUS® Interface Modules

- Sensor interface modules provide a dc powered interface for *Presence*PLUS *P4* vision sensors
- Lighting interface modules allows strobe operation of Banner's lighting with any vision sensor or vision system
- Strobe control module provides control of specialty strobed LED lights
- Power supplies provide power to continuous LED lights or *Presence*PLUS vision sensors

*Presence*PLUS® Sensor Interface Modules

Sensor Models: ***P4***

Model	Outputs	Connections	Data Sheet
PPSIM-NT	Current Sinking (NPN)	Two 13-pin Terminals	126330
PPSIM-NC		One 13-pin Terminals One DB-15 Connector	
PPSIM-PT	Current Sourcing (PNP)	Two 13-pin Terminals	126330
PPSIM-PC		One 13-pin Terminals One DB-15 Connector	

Light Interface Modules

Used with Banner Vision Lights

Model	Supply Voltage	Strobe Output	Data Sheet
PPLIM	24V dc	5V @ 10 mA max.	128190

Strobe Control Module

Used with specialty lights ending in N or N-S

Model	Input	Trigger Input	Output	Output Pulse Range	Data Sheet
SCM*	24V dc ±5% 2 A max.	5V @ 10 mA max.	2-channels 24V dc ±5% 9A nominal per channel @ 60 Hz	5 to 1,300 microseconds	67448

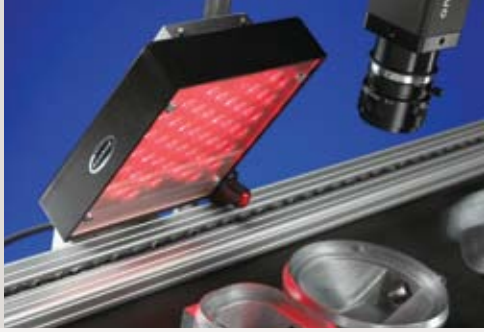
PSA.. & PSC..

PSDINA-24

Continuous Power Supplies

Model	Input	Input Cord	Outputs	Output Cable	Used With	Data Sheet
PSA-12	100-250V ac 50/60 Hz	North America (NEMA 5-15)	12V dc ±5% with voltage regulation of ±1% 3.5 A max.	1.8 m Terminated with 9-pin D-sub connector (female pins)	Continuous LED Lights	67445
PSA-12E		Cont. Europe (Schuko CEE 7)				
PSA-24	100-250V ac 50/60 Hz	North America (NEMA 5-15)	24V dc ±5% with voltage regulation of ±1% 2.2 A max.	1.8 m Terminated with 9-pin D-sub connector (female pins)	Continuous LED Lights	67447
PSA-24E		Cont. Europe (Schuko CEE 7)				
PSC-24*	115-250V ac 50/60 Hz (Auto Select)	North America (NEMA 5-15)	24V dc ±5% with voltage regulation of ±1% 2.2 A max.	1.8 m 2-wire Unterminated	SCM Strobe Control Module	67446
PSC-24E*		Cont. Europe (Schuko CEE 7)				
PSDINA-24 (DIN-rail mountable)	115-230V ac (Auto Select)	—	24V dc @ 2.5 A max.	—	*P4, Pro* & Lights	—

* These products are not stocked and are non-returnable.



Test Power Supply

Sensor Models: ***P4***

Model	Input	Input	Trigger Option	Data Sheet
P4D1	100-240V ac	North America (AC plug)	• 24V dc NPN Sensor • Continuous pulse • Single pulse	—

Note: 1 amp power supply used to power *P4* sensor and lighting for proving an application without integation into a control panel.

Lighting Variable Power Supplies*

Model	Input	Input Cord	Outputs	Output Cable	Used With	Data Sheet
PS2V-12	100-140V ac 60 Hz	North America (NEMA 5-15)	2-channels 6-12V dc	1.8 m Terminated with 9-pin D-sub connector (female pins)	Continuous LED Lights	67449
PS2V-12E	200-250V ac 50 Hz	Cont. Europe (Schuko CEE 7)	2 A max. per channel			

Lighting Power Supply Extension Cables*

Model	Length	Input Cord	Used With
DB906	1.8 m	Cable powers one continuous light (one end male pins and one end female; both ends terminated with 9-pin D-sub connector)	Continuous LED Lights
DB910	3.0 m		
DB9Y	1.8 m	Cable powers two continuous lights with one supply (9 m trunk with male connector and 9 m branches with female connector; ends terminated with 9-pin D-sub connector)	Continuous LED Lights
DB906S	1.8 m	Cable powers one strobed light (one end male pins and one end female; both ends terminated with 9-pin D-sub connector)	Strobed LED Lights
DB910S	3.0 m		
DB9YS	1.8 m	Cable powers one strobed light (9 m trunk with male connector and 9 m branches with female connector; ends terminated with 9-pin D-sub connector)	Strobed LED Lights

* These products are not stocked and are non-returnable.

Additional Literature

Description	Used With	Data Sheet
*Presence*PLUS Software on CD-ROM—Available for Download Online	*Pro*, *P4*	72806
Pro Sensors Manual	*Pro*	68367
Pro COLOR Sensors Manual*	*Pro* COLOR	77574
Pro & *Pro* COLOR Quick Start Guide	*Pro*	68369
P4 OMNI & OMNI 1.3 Sensors Manual	P4 OMNI, *P4* OMNI 1.3	125808
P4 COLOR Sensor Manual*	*P4* COLOR	77575
P4 GEO and GEO 1.3 Sensors Manual	*P4* GEO, *P4* GEO 1.3	121555
P4 AREA & AREA 1.3 Sensors Manual	*P4* AREA, *P4* AREA 1.3	125439
P4 EDGE and EDGE 1.3 Sensors Manual	*P4* EDGE, *P4* EDGE 1.3	120413
P4 BCR & BCR 1.3	*P4* BCR, *P4* BCR 1.3	122800
P4 Quickstart Guide	*P4*	118000

* Available Q2 2007

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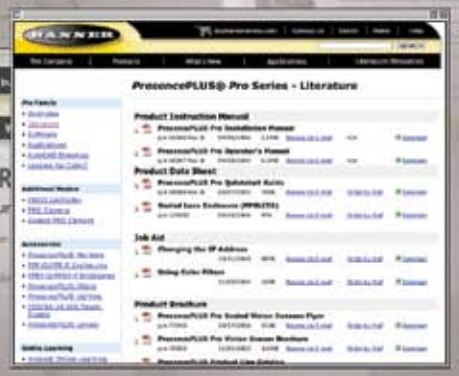
Product Information

Literature & Resources



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