more sensors, more solutions

EZ-LIGHT™ K50 & K80 Series Pick-to-Light Sensors

Compact, Single-Point Devices for Error-Proofing of Bin-Picking Operations

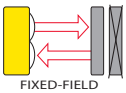
Contact Factory for more information.

Features

- Rugged, cost-effective and easy-to-install solutions for error-proofing and parts-verification applications
- Compact devices are completely self-contained — no controller needed
- Illuminated dome provides a big, easy-to-see green job light; some models also light red for alternate operation (see Specialty models listed on page 2)
- Push-button and passive-actuation models available
- Fully encapsulated IP67 construction – ideal for use in abusive environments; rated to IP69K, depending on installation; see specifications
- Immune to ambient light, EMI and RFI interference
- AS-i module compatible
- 12 to 30V dc operation

Standard Models – Single Color

- Job light is ON at all times while job input is active.
- Presence of hand (or pressing push button) activates output.

Models	Sensing Mode/LED	Housing	Range	Cable*	Output	Output Type	Job Light
K50APLPGXDQ	 POLAR RETRO Visible red, 680 nm	50 mm dome/ 30 mm mount polycarbonate	2 m	Integral 4-pin Euro QD	NO	PNP	Green
K50RPLPGXDQ					NC		
K50ANLPGXDQ					NO	NPN	
K50RNLPGXDQ					NC		
K50APFF50GXDQ	 FIXED-FIELD Infrared, 880 nm		50 mm Cutoff		NO	PNP	
K50RPFF50GXDQ					NC		
K50ANFF50GXDQ					NO	NPN	
K50RNFF50GXDQ					NC		
K50APFF100GXDQ			100 mm Cutoff		NO	PNP	
K50RPFF100GXDQ					NC		
K50ANFF100GXDQ					NO	NPN	
K50RNFF100GXDQ					NC		
K50APPBGXDQ	 PUSH-BUTTON		—		NO	PNP	
K50RPPBGXDQ					NC		
K50ANPBGXDQ					NO	NPN	
K50RNPBGXDQ					NC		
K80APPBGXDQ		50 mm dome/ Flat or DIN-mount polycarbonate			NO	PNP	
K80RPPBGXDQ					NC		
K80ANPBGXDQ					NO	NPN	
K80RNPBGXDQ					NC		

See Safety Use Warning on Page 2

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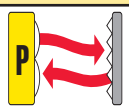
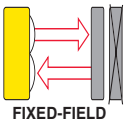
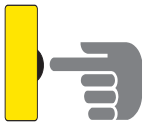
EZ-LIGHT™ K50 & K80 Series Pick-to-Light Sensors

Specialty C-Series Models – Two Color

- Job light is Green while job input is active (unless hand is present).
- Presence of hand (or pressing push button) activates output and overrides job light (turns Red) for visual verification that action was sensed.
- Retroreflective models: To simplify alignment, sensor provides Red signal when retroreflective target is not correctly aligned.

Models	Sensing Mode/LED	Housing	Range	Cable*	Output	Output Type	Job Light
K50APLPGRCQ	 POLAR RETRO Visible red, 680 nm	50 mm dome/ 30 mm mount polycarbonate	2 m	Integral 4-pin Euro QD	NO	PNP	Green (Red)
K50RPLPGRCQ					NC		
K50ANLPGRCQ					NO	NPN	
K50RNLPGRCQ					NC		
K50APFF50GRCQ	 FIXED-FIELD Infrared, 880 nm		50 mm Cutoff		NO	PNP	
K50RPFF50GRCQ					NC		
K50ANFF50GRCQ					NO	NPN	
K50RNFF50GRCQ					NC		
K50APFF100GRCQ			100 mm Cutoff		NO	PNP	
K50RPFF100GRCQ					NC		
K50ANFF100GRCQ					NO	NPN	
K50RNFF100GRCQ					NC		
K50APPBGRCQ	 PUSH-BUTTON		—		NO	PNP	
K50RPPBGRCQ					NC		
K50ANPBGRCQ					NO	NPN	
K50RNPBGRCQ					NC		
K80APPBGRCQ		50 mm dome/ Flat or DIN-mount polycarbonate			NO	PNP	
K80RPPBGRCQ					NC		
K80ANPBGRCQ					NO	NPN	
K80RNPBGRCQ					NC		

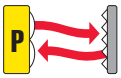
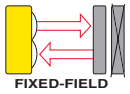
WARNING . . . Not To Be Used for Personnel Protection

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

Specialty E-Series Models – Two Color

- Job light is Green at all times while job input is active.
- Presence of hand (or pressing push button) activates output.
- Presence of hand (or pressing push button) while job input is inactive causes unit to light Red, providing visual verification that sensor is functioning properly.

Models	Sensing Mode/LED	Housing	Range	Cable*	Output	Output Type	Job Light
K50APLPGREQ	 Visible red, 680 nm	50 mm dome/ 30 mm mount polycarbonate	2 m	Integral 4-pin Euro QD	NO	PNP	Green (Red)
K50RPLPGREQ					NC		
K50ANLPGREQ					NO	NPN	
K50RNLPGREQ					NC		
K50APFF50GREQ	 Infrared, 880 nm		50 mm Cutoff		NO	PNP	
K50RPFF50GREQ					NC		
K50ANFF50GREQ					NO	NPN	
K50RNFF50GREQ					NC		
K50APFF100GREQ			100 mm Cutoff		NO	PNP	
K50RPFF100GREQ					NC		
K50ANFF100GREQ					NO	NPN	
K50RNFF100GREQ					NC		
K50APPBGREQ			—		NO	PNP	
K50RPPBGREQ					NC		
K50ANPBGREQ					NO	NPN	
K50RNPBGREQ					NC		
K80APPBGREQ		50 mm dome/ Flat or DIN-mount polycarbonate			NO	PNP	
K80RPPBGREQ					NC		
K80ANPBGREQ					NO	NPN	
K80ANPBGREQ					NC		

*Integral QD models are listed. For 2 m (6') cable, omit suffix **Q** from model number (example, **K50APLPGRC**). For 150 mm PVC pigtail with QD, replace **Q** with **QP** in model number (example, **K50APLPGRCQP**). For 9 m (30') cable, replace suffix **Q** with **W/30** in model number (example, **K50APLPGRC W/30**). A model with a QD requires a mating cable (see page 7).

EZ-LIGHT™ K50 & K80 Series Pick-to-Light Sensors

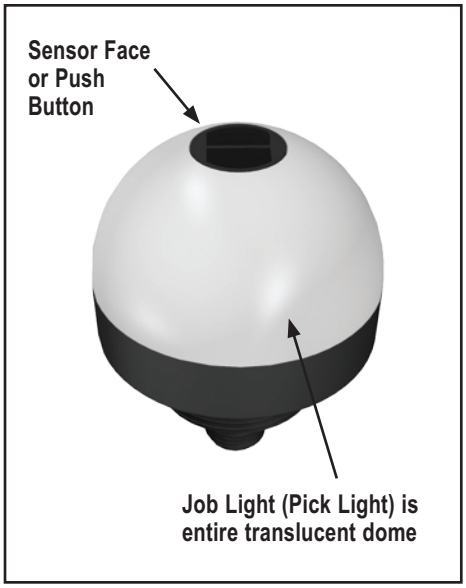


Figure 1. Features

Overview

The K50 & K80 Pick-to-Light Sensors are suited to many part assembly and bin picking (pick-to-light) applications. The entire translucent dome provides the green job light or other indication (depending on model), for high visibility. The solid-state output easily interfaces to a system controller, which is pre-programmed for a specific sequence of tasks. Mounted in or near each bin in an assembler's work station, the sensor job light signals the assembler:

- Which bins contain items to be picked in a given operation; and
- In what order they should be picked.

As the assembler takes a part in sequence, the K50 or K80 senses a hand in the bin and its output sends a signal to the controller. (For push-button models, the sensing occurs when the button is pushed. For other models, no action other than reaching for the part is required for the sensor to detect when a pick is made.)

The system controller then verifies if the correct part was taken and may respond by turning that job light OFF and activating the job light of the next bin in the sequence. If multiple parts are to be removed from one bin, the job light may remain ON until the appropriate number of signals is returned to the controller. If an incorrect part is selected, the control system may be wired to signal an alarm for the assembler and/or a supervisor, or it may be programmed to interpret the action as a call for parts.

The job light system results in increased efficiency (due to simplified job training), increased quality control (no skipped components), and reduced rework and inspections. It speeds the resumption of work after breaks and other distractions and is ideal for multilingual workplaces where communication is an issue.

The fixed-field and retroreflective-mode models require no interaction to operate, and so eliminate the hand, wrist, and arm stresses associated with mechanical push buttons. All models are immune to EMI, RFI, and ambient light interference. The polycarbonate and nylon housing is capable of absorbing high impact (even at low temperatures) and is resistant to abrasion and to damage by most chemicals. Its domed construction allows most dust and debris to slide easily off the sensor housing, simplifying maintenance. The 30 mm threaded base on all models provides easy mounting. Indicator behavior is shown in the table below.

K50 & K80 Indicator and Output Behavior

Models	Sensor Conditions		Job Light	Alternate Indicator	Output Signal Status
Standard (D-Series)	Job Input Active	Hand/pick absent	ON Green	—	OFF
		Hand/pick present	ON Green	—	ON
	No Job Input	Hand/pick absent		—	OFF
		Hand/pick present		—	ON
C-Series	Job Input Active	Hand/pick absent	ON Green	—	OFF
		Hand/pick present	—	ON Red	ON
	No Job Input	Hand/pick absent	OFF	OFF	OFF
		Hand/pick present	—	ON Red	ON
E-Series	Job Input Active	Hand/pick absent	ON Green	—	OFF
		Hand/pick present	ON Green	—	ON
	No Job Input	Hand/pick absent	OFF	—	OFF
		Hand/pick present	—	ON Red	ON

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Installation

Mechanical Installation

The EZ-LIGHT™ K50 & K80 Sensors should be installed at such a height and in a location that will be comfortable for the user. When multiple sensors will be located in close proximity, to monitor multiple bins for example, it is a good idea to mount all the sensors in a similar sensing position (all mounted at the tops of the bins and pointing down, for example). This will reduce potential optical crosstalk, where one sensor detects another sensor's beam.

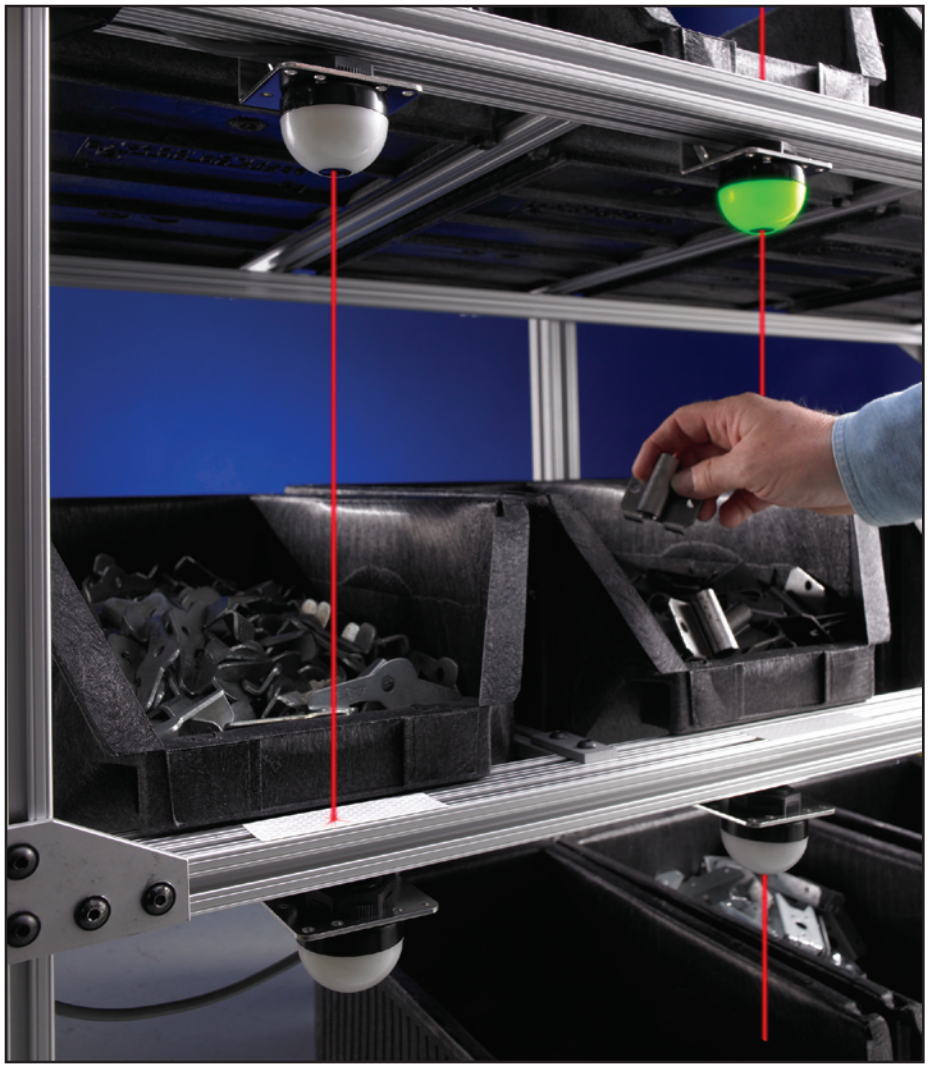


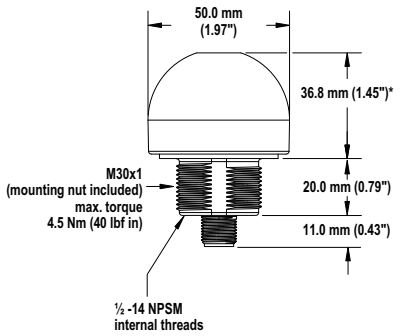
Figure 2. Mount multiple sensors in a similar position and orientation to eliminate optical crosstalk (retroreflective models shown)

Specifications

Supply Voltage and Current	12 to 30V dc (10% maximum ripple) Less than 60 mA max current @ 12V dc (exclusive of load) Less than 40 mA max current @ 30V dc (exclusive of load) AS-i compatible
Supply Protection Circuitry	Protected against transient voltages (fast-transient and over-voltage) and reverse polarity
Output Configuration	1 current sinking (NPN) transistor or 1 current sourcing (PNP) transistor, depending on model
Output Rating	**Maximum load:** 150 mA **ON-state saturation voltage:** < 2V @ 10 mA dc; < 2.5V @ 150 mA dc **OFF-state leakage current:** < 1 µA @ 30V dc
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short-circuit of output
Output Response Time	3 milliseconds ON and OFF
Indicators	Entire translucent dome provides indicator light; either Job or Pick Sensed indicator inhibits the other light, depending on model. **Job ("Pick") Indicator:** Green **Pick Sensed Indicator:** Red or OFF, depending on model
Job Light Enable Input	**Input impedance:** 8000 ohms **Sinking—**Input low < 1.0V **Sourcing—**Input high > 7V
Construction	**Base:** polycarbonate **Lens:** polycarbonate or acrylic **Translucent dome:** polycarbonate **Push button:** thermoplastic
Environmetal Rating	Fully encapsulated; IEC IP67 **Integral QD models:** DIN 40050 (IP69K) when using IP69K-rated cables **Pigtail and cable models:** IP69K when mounted with conduit
Connections	Integral 4-pin Euro-style QD fitting, PVC-jacketed 2 m (6.5') or 9 m (30') cable or 150 mm (6") PVC pigtail with 4-pin Euro-style QD fitting, depending on model. Accessory QD cables required for QD models; see page 6. QPMA-style PUR pigtail models are also available; contact Factory for more information.
Ambient Light Immunity	Up to 5,000 lux
EMI/RFI Immunity	Immune to EMI and RFI noise sources, per IEC 947-5-2.
Operating Conditions	**Temperature:** −40° to +50° C (−40° to +122° F) **Max. Relative Humidity:** 90% @ +50° C (non-condensing)
Certifications	CE

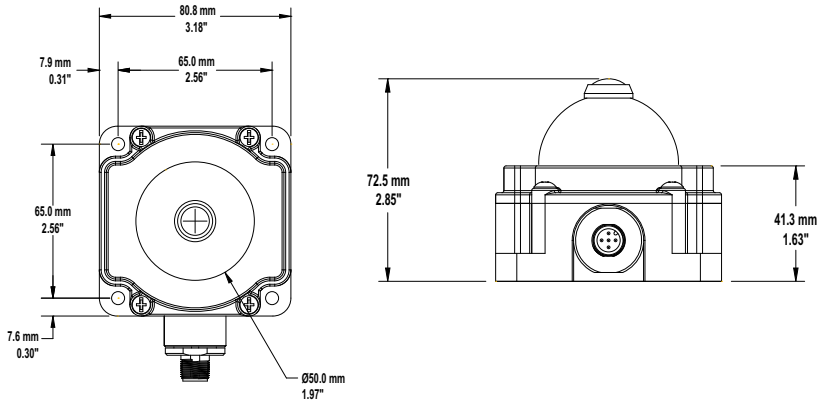
Dimensions

K50



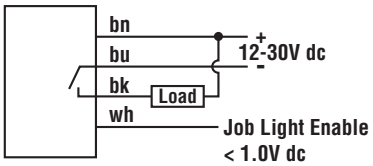
*For push-button models, this dimension is 44.2 mm (1.74")

K80

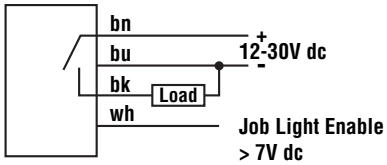


Hookups

NPN (Sinking) Output Models



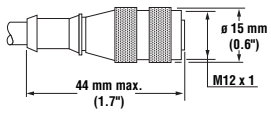
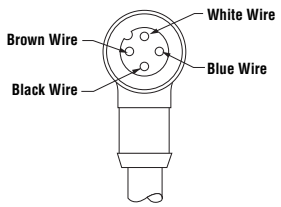
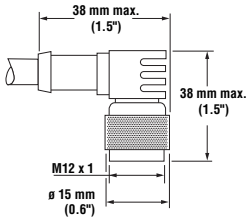
PNP (Sourcing) Output Models



NOTE: Cabled hookups are shown. Hookups are functionally identical for cabled or quick-disconnect models.

Accessories

Quick-Disconnect (QD) Cables

Style	Model	Length	Dimensions	Pinout
4-Pin Euro Straight	**MQDC-406** **MQDC-415** **MQDC-430**	2 m (6.5') 5 m (15') 9 m (30')		
4-Pin Euro Right-Angle	**MQDC-406RA** **MQDC-415RA** **MQDC-430RA**	2 m (6.5') 5 m (15') 9 m (30')		

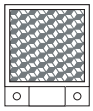
EZ-LIGHT™ K50 & K80 Series Pick-to-Light Sensors

Mounting Brackets

SMB30A	• 12-ga. stainless steel right-angle mounting bracket with curved slot for versatile orientation • Clearance for M6 (¼") hardware		**SMB30FA**	• 12-ga. 300 series stainless steel • Right-angle bracket with 30 mm hole for mounting sensors • Attachment clamp allows 360° rotation • Threaded rod through-mounts to mounting surface	
SMB30MM	• 30 mm 12-ga. stainless steel bracket with curved mounting slots for versatile orientation • Clearance for M6 (¼") hardware • Articulation slots for 90°+ rotation		**SMBAMS30P**	• 12-ga. 300 series stainless steel • Flat SMBAMS series bracket with 30 mm hole for mounting sensors • Articulation slots for 90°+ rotation	
SMBAMS30RA	• 12-ga. 300 series stainless steel • Right-angle SMBAMS series bracket with 30 mm hole for mounting sensors • Articulation slots for 90°+ rotation		**SMB30FVK**	• V-clamp, straight bracket and fasteners for mounting sensors to pipe or extrusions • Clamp accommodates 28 mm dia. tubing or 1" square extrusions • 30 mm hole for mounting sensors	
SMB30SC	• 30 mm swivel bracket • Black reinforced thermoplastic polyester • Includes stainless steel mounting and swivel locking hardware		**SMB30RAVK**	• V-clamp, right-angle bracket and fasteners for mounting sensors to pipe or extrusions • Clamp accommodates 28 mm dia. tubing or 1" square extrusions • 30 mm hole for mounting sensors	

Retroreflective Targets

A full selection of brackets is available for the targets listed below. See the Accessories section of your current Banner Photoelectric Sensors catalog or the Banner website for complete information.

BRT-35X35B	• Square, acrylic target • Reflectivity Factor: 1.3 • Max. Temperature: 65° C • Approximate size: 35 mm x 35 mm		**BRT-100X18A**	• Rectangular, acrylic target • Reflectivity Factor: 1.4 • Max. Temperature: 50° C • Approximate size: 18.5 mm x 110 mm	
BRT-50D	• Round, acrylic target with mounting stud • Reflectivity Factor: 1.0 • Max. Temperature: 65° C • Optional brackets are available; see catalog • Approximate size: 50 mm diameter				
BRT-2X2	• Square, acrylic target • Reflectivity Factor: 1.0 • Max. Temperature: 50° C • Optional brackets are available; see catalog • Approximate size: 51 mm x 51 mm		**See Catalog or Website**	Banner offers a wide selection of high-quality retroreflective tape targets, both continuous roll and individual sheets. See the Accessories section of your current Banner Photoelectric Sensors catalog or the Banner website for complete information.	

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WARRANTY: Banner Engineering Corp. warrants its products to be free from defects for one year. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.

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