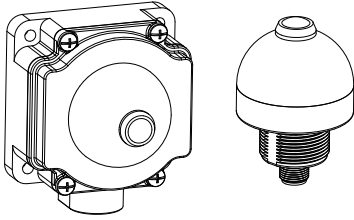# EZ-LIGHT® K50 and K80 Specialty — 3-Color

# Datasheet

Compact, single-point devices for error-proofing of bin-picking operations

- 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, red or yellow job light
- Push-button and passive-actuation models available
- Choose NPN or PNP output, depending on model
- 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
- 12 to 30 V dc operation
- 5-pin M12/Euro-style PUR pigtail (150 mm) with quick disconnect fitting

| Model [1] | Sensing Mode / LED | Housing | Range | Output[2] | Job Light |
|---|---|---|---|---|---|
| K50RPLPGRYC3QPMA | Polarized retroreflective, visible red, 680 nm | 50 mm dome 30 mm mount polycarbonate | 2 m (6 ft) | PNP, normally closed | Green/ yellow/ red |
| K50RPLPGRYC4QPMA | | | | | |
| K50APFF50GRYC3QPMA | Fixed field, infrared, 880 nm | | 50 mm cutoff | PNP, normally open | |
| K50APFF50GRYC4QPMA | | | | | |
| K50APFF100GRYC3QPMA | | | 100 mm cutoff | | |
| K50APFF100GRYC4QPMA | | | | | |
| K50APPBGRYC3QPMA | Push button | | — | | |
| K50APPBGRYC4QPMA | | | | | |
| K80APPBGRYC3QPMA | | 50 mm dome Flat or DIN- mount polycarbonate | | | |
| K80APPBGRYC4QPMA | | | | | |

A model with a quick disconnect fitting requires a mating cable (see *5-Pin Euro-Style Cordsets*).

⚠️ WARNING: Not To Be Used for Personnel Protection

Never use this device as a sensing device for personnel protection. Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

## Overview

The solid-state output 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 and pushes the button, the sensor senses that the part was removed and sends an output signal to the controller. The controller verifies if the correct part was taken and may respond by turning that job light OFF, activating the job light of the next bin in the sequence.

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[1] The 5-pin 150 mm M12/Euro-style PUR pigtail quick disconnect models are listed.
- To order the 2 m (6 ft) PVC cable model, omit the suffix "QPMA" from the model number (e.g., "K50RPLPGRYC3").
- To order the 9 m (30 ft) PVC cable model, replace the suffix "QPMA" with "W/30" (e.g., "K50RPLPGRYC3 W/30").
- To order the 150 mm (5.9 in) PVC pigtail with 5-pin M12/Euro-style fitting, replace the suffix "QPMA" with "QP" (e.g., "K50RPLPGRYC3QP").

[2] PNP models only are listed. For other output types, contact the Factory.

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.

## Indicator and Output Behavior

📝 NOTE: "C3" and "C4" models as referenced in the table pertain to a part of the product model number, immediately preceding the QPMA designation.

| Sensor Conditions | | Job Light | | Output Signal Status |
|---|---|---|---|---|
| | | C3 Models | C4 Models | |
| Job input active | Hand/pick absent | On Green | On Green | Off |
| | Hand/pick present | On Yellow | On Yellow until job input is removed | On |
| No job input | Hand/pick absent | Off | Off | Off |
| | Hand/pick present | On Red | On Red for 5 seconds after hand/pick is removed | On |

## Specifications

**Supply Voltage and Current**
12 to 30 V dc (10% max. ripple)
< 90 mA max. current at 12 V dc (exclusive of load)
< 60 mA max. current at 30 V dc (exclusive of load)

**Supply Protection and 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. Retroreflective models have normally closed (N.C.) output; all other models have normally open (N.O.) output.

**Output Rating**
Max. load: 150 mA
ON-state saturation voltage:
PNP models: < 2 V at 10 mA dc; < 2.5 V at 150 mA dc
NPN models: < 1.5 V at 10 mA dc; < 2 V at 150 mA dc
OFF-state leakage current: < 10 µA at 30 V dc

**Output Protection**
Protected against false pulse on power-up and continuous overload or short circuit of output

**Output Response Time**
5 milliseconds ON, 500 ms leading edge OFF

**Power-Up Output Delay Time**
300 ms

**Indicators**
Entire translucent dome provides indicator light:
Job (Pick) – Green
Pick Sensed – Yellow
Mispick – Red

**Job Light Enable**
Input impedance: 8K Ohms
Sinking – Input low < 1.0 V
Sourcing – Input high > 7 V

**Construction**
Base: polycarbonate
Translucent dome: polycarbonate
Push button: thermoplastic
Lens: polycarbonate or acrylic

**Connections**
150 mm pigtail with 5-pin M12/Euro-style quick disconnect fitting (QPMA); accessory cordset required for QD models.

**Ambient Light Immunity**
Up to 5,000 lux

**EMI-RFI Immunity**
Immune to EMI and RFI noise sources, per IEC 947-5-2.

**Environmental Rating**
Fully encapsulated; IEC IP67
Integral QD models meet DIN 40050 (IP69K) when using IP69K-rated cables; pigtail and cable models meet IP69K when mounted with conduit

**Operating Conditions**
−40 °C to +50 °C (−40 °F to +122 °F)
90% at +50 °C maximum relative humidity (non-condensing)
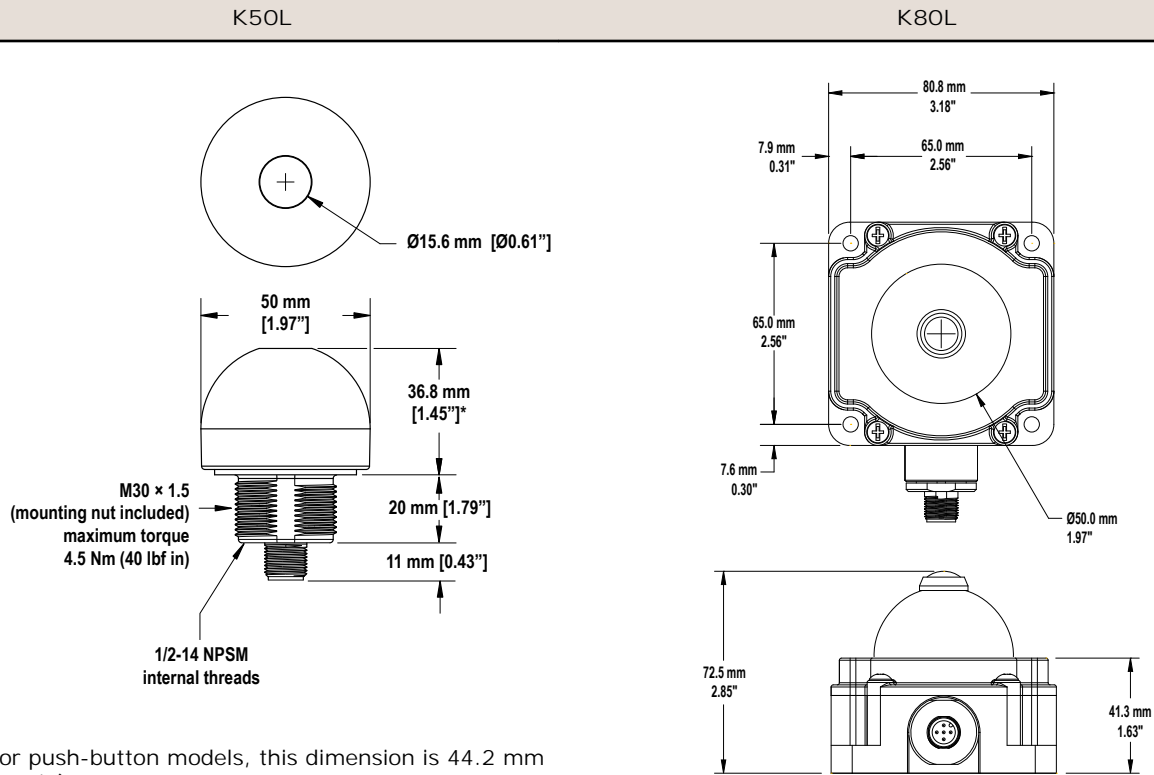
**Certifications**

K50 models:  CE     c(UL)us LISTED

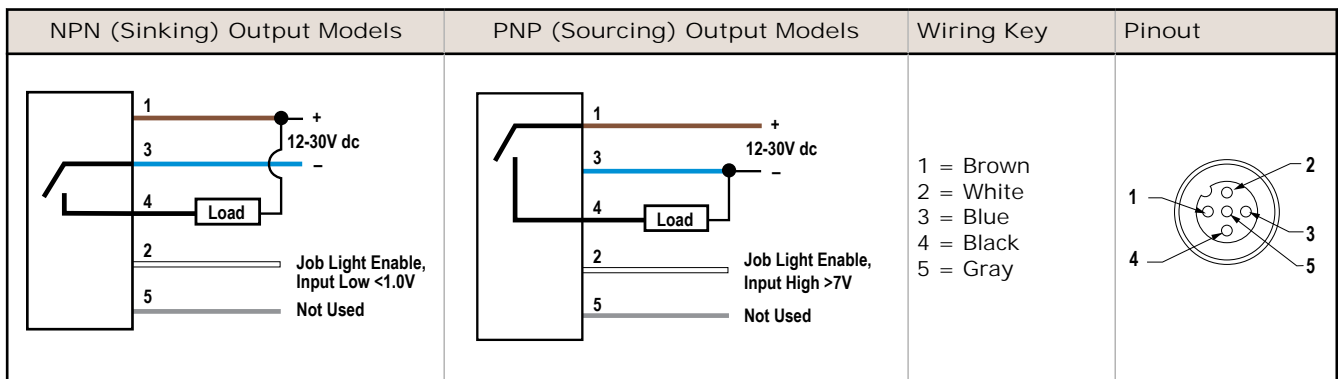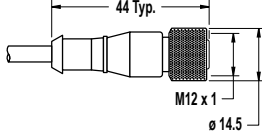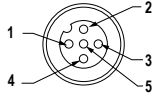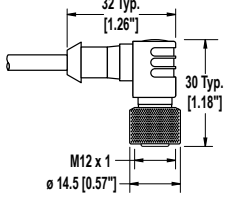All models except push buttons

K80 models:  CE

## Dimensions

| K50L | K80L |
|---|---|



Ø15.6 mm [Ø0.61"]

50 mm [1.97"]

36.8 mm [1.45"]*

M30 × 1.5 (mounting nut included) maximum torque 4.5 Nm (40 lbf in)

20 mm [1.79"]

11 mm [0.43"]

1/2-14 NPSM internal threads

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

80.8 mm 3.18"

7.9 mm 0.31"

65.0 mm 2.56"

65.0 mm 2.56"

7.6 mm 0.30"

Ø50.0 mm 1.97"

72.5 mm 2.85"

41.3 mm 1.63"

## Wiring Diagram

| NPN (Sinking) Output Models | PNP (Sourcing) Output Models | Wiring Key | Pinout |
|---|---|---|---|
|  |  | 1 = Brown<br>2 = White<br>3 = Blue<br>4 = Black<br>5 = Gray |  |
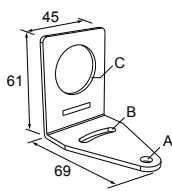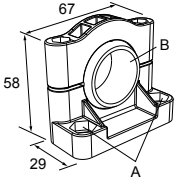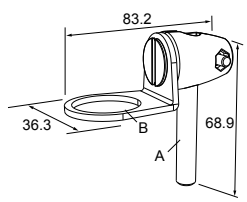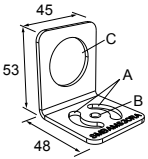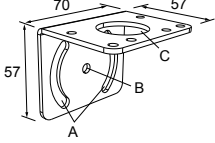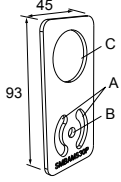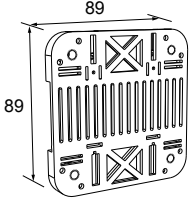
NOTE: Cabled wiring diagrams only are shown. Wiring is functionally identical for cabled and quick-disconnect models.
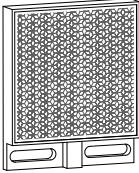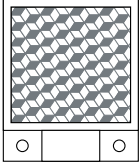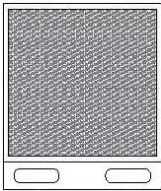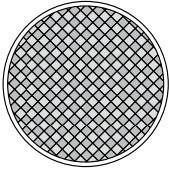
# Accessories

| 5-Pin Threaded M12/Euro-Style Cordsets (Single Ended) | | | | |
|---|---|---|---|---|
| Model | Length | Style | Dimensions | Pinout (Female) |
| MQDC1-501.5 | 0.50 m (1.5 ft) | Straight | | |
| MQDC1-506 | 1.83 m (6 ft) | Straight | | |
| MQDC1-515 | 4.57 m (15 ft) | Straight | | |
| MQDC1-530 | 9.14 m (30 ft) | Straight | | |
| MQDC1-506RA | 1.83 m (6 ft) | Right-Angle | | |
| MQDC1-515RA | 4.57 m (15 ft) | Right-Angle | | |
| MQDC1-530RA | 9.14 m (30 ft) | Right-Angle | | |

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Gray

## Brackets (All measurements are listed in millimeters (inches), unless noted otherwise.)

### SMB30A
- Right-angle bracket with curved slot for versatile orientation
- Clearance for M6 (¼ in) hardware
- Mounting hole for 30 mm sensor
- 12-ga. stainless steel

Hole center spacing: A to B=40
Hole size: A=ø 6.3, B= 27.1 x 6.3, C=ø 30.5

### SMB30SC
- Swivel bracket with 30 mm mounting hole for sensor
- Black reinforced thermoplastic polyester
- Stainless steel mounting and swivel locking hardware included

Hole center spacing: A=ø 50.8
Hole size: A=ø 7.0, B=ø 30.0

### SMB30FA
- Swivel bracket with tilt and pan movement for precise adjustment
- Mounting hole for 30 mm sensor
- 12-ga. 304 stainless steel
- Easy sensor mounting to extrude rail T-slot
- Metric and inch size bolt available

Bolt thread: SMB30FA, A= 3/8 - 16 x 2 in; SMB30FAM10, A= M10 - 1.5 x 50
Hole size: B= ø 30.1

### SMBAMS30RA
- Right-angle SMBAMS series bracket
- 30 mm hole for mounting sensors
- Articulation slots for 90° + rotation
- 12-ga. (2.6 mm) cold-rolled steel

Hole center spacing: A=26.0, A to B=13.0
Hole size: A=26.8 x 7.0, B=ø 6.5, C=ø 31.0

## Brackets (All measurements are listed in millimeters (inches), unless noted otherwise.)

**SMB30MM**
- 12-ga. stainless steel bracket with curved mounting slots for versatile orientation
- Clearance for M6 (¼ in) hardware
- Mounting hole for 30 mm sensor

Hole center spacing: A = 51, A to B = 25.4
Hole size: A = 42.6 x 7, B = ø 6.4, C = ø 30.1

**SMBAMS30P**
- Flat SMBAMS series bracket
- 30 mm hole for mounting sensors
- Articulation slots for 90° + rotation
- 12-ga. 300 series stainless steel

Hole center spacing: A=26.0, A to B=13.0
Hole size: A=26.8 x 7.0, B=ø 6.5, C=ø 31.0

**SMBDX80DIN**

Black reinforced thermoplastic Bracket for mounting on a 35 mm DIN rail

## Retroreflective Targets

**BRT-2X2**
- Square, acrylic target
- Reflectivity factor: 1.0
- Max. temperature: +50 °C (+122 °F)
- Optional brackets are available
- Approximate size: 51 mm × 51 mm

**BRT-35X35B**
- Square, acrylic target
- Reflectivity Factor: 1.3
- Temperature: −20 °C to +60 °C (−4 °F to +140 °F)
- Approximate size: 35 mm × 35 mm

**BRT-51X51BM**
- Square, acrylic target
- Reflectivity Factor: 1.5
- Max. Temperature: +50 °C (+122 °F)
- Micro-prism geometry
- Optional brackets are available
- Approximate size: 51 mm × 51 mm

**BRT-50D**
- Round, acrylic target with mounting stud
- Reflectivity factor: 1.0
- Temperature: −20 °C to +60 °C (−4 °F +140 °F)
- Optional brackets are available
- Approximate size: 50 mm diameter

| Retroreflective Targets | |
|---|---|
| **BRT- 100X18A**<br>• Rectangular, acrylic target<br>• Reflectivity factor: 1.4<br>• Temperature: −20 °C to +60 °C<br>  (−4 °F to +140 °F)<br>• Approximate size: 18.5 mm × 120 mm | NOTE: For a complete selection of retroreflective targets, see *www.bannerengineering.com*. |

Retroreflective Tape

| Model | Reflectivity Factor | Maximum Temperature | Size |
|---|---|---|---|
| BRT-THG-1-100 | 0.7 | +60 °C (+140 °F) | 25 mm (1 in) wide, 2.5 m (100 in) long |
| BRT-THG-2-100 | 0.7 | +60 °C (+140 °F) | 50 mm (2 in) wide, 2.5 m (100 in) long |
| BRT-THG-3-100 | 0.7 | +60 °C (+140 °F) | 75 mm (3 in) wide, 2.5 m (100 in) long |
| BRT-TVHG-2X2 | 0.8 | +60 °C (+140 °F) | 50 x 50 mm |

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