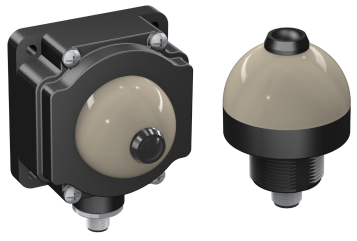
Features

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 amber 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 per ISO 20653, depending on installation; see specifications
- Immune to ambient light, EMI, and RFI interference
- 12 V DC to 30 V DC operation
- 150 mm (6 in) PUR-jacketed cable with a 5-pin M12 male quick-disconnect connector

WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

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 Accessories).

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.

(1)
The 150 mm (6 in) PUR-jacketed cable with a 5-pin M12 male quick-disconnect connector 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 (6 in) PVC-jacketed cable with a 5-pin M12 male quick-disconnect connector fitting, replace the suffix "**QPMA**" with "**QP**" (e.g., "**K50RPLPGRYC3QP**").

(2) PNP models only are listed. For other output types, contact the Factory.

Original Instructions
17-Jun-25

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137551
p/n: 137551 Rev. E

ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

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

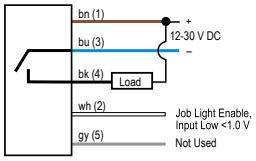
Sensor Conditions		Indicator		Output Signal Status
		C3 Models	C4 Models	
Job input active	Hand/pick absent	On Green	On Green	Off
	Hand/pick present	On Yellow	On Yellow until job input is removed	On
No job input	Hand/pick absent	Off	Off	Off
	Hand/pick present	On Red	On Red for 5 seconds after hand/pick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

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

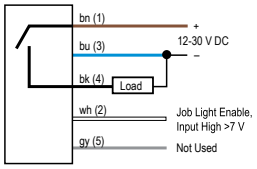
Wiring

Cabled wiring diagrams are shown. Quick disconnect wiring diagrams are functionally identical.

NPN Models



PNP Models



Specifications

Supply Voltage and Current

12 V DC 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 NPN transistor or 1 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

EMI-RFI Immunity

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

Environmental Rating

Fully encapsulated; IP67

Integral quick-disconnect models meet IP69K per ISO 20653 when using IP69K-rated cables; unterminated 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)

Power-Up Output Delay Time

300 ms

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 (6 in) PUR-jacketed cable with a 5-pin M12 male quick-disconnect connector fitting (QPMA); accessory cordset required for quick-disconnect models.

Ambient Light Immunity

Up to 5,000 lux

Indicators

Entire translucent dome provides indicator light:

Job (Pick) – Green

Pick Sensed – Yellow

Mispick – Red

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Required Overcurrent Protection

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (A)	Supply Wiring (AWG)	Required Overcurrent Protection (A)
20	5.0	26	1.0
22	3.0	28	0.8
24	1.0	30	0.5

Certifications

Banner Engineering BV
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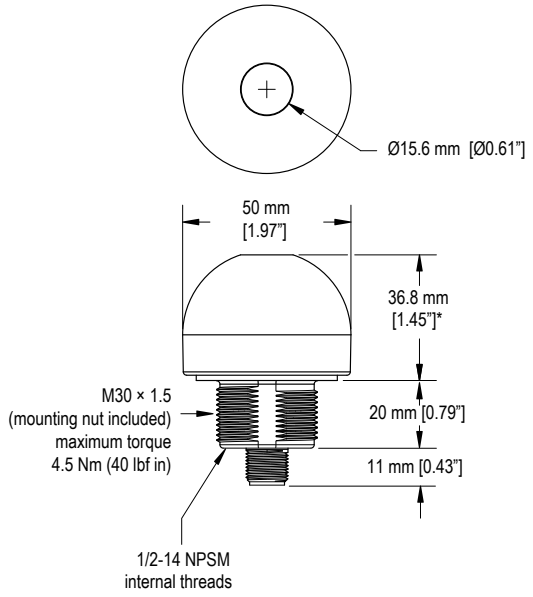
1831 Diegem, BELGIUM

Dimensions

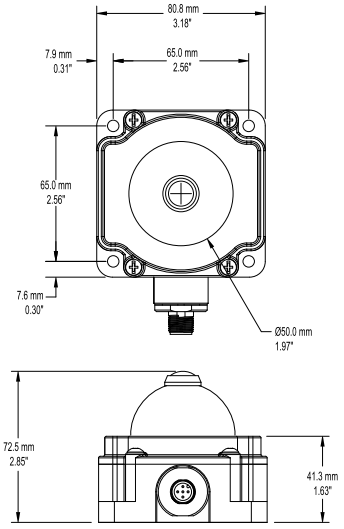
All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.

K50L Models



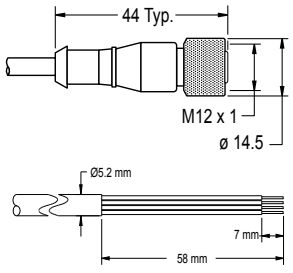
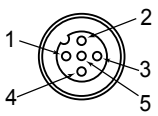
*For push-button models, this dimension is 44.2 mm (1.74 in)

K80L Models



Accessories

Cordsets

4-Pin Single-Ended M12 Female Cordsets					
Model	**Length**	**Style**	**Dimensions**	**Pinout (Female)**	
MQDC-406	2 m (6.56 ft)	Straight			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Not used
MQDC-415	5 m (16.4 ft)				
MQDC-430	9 m (29.5 ft)				
MQDC-450	15 m (49.2 ft)				

Continued on page 4

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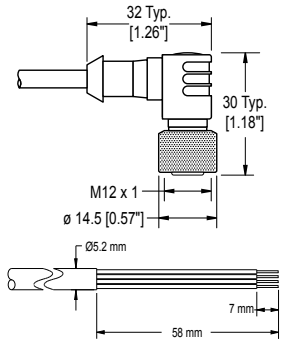
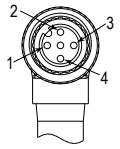
Continued from page 3

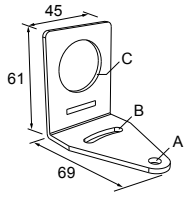
4-Pin Single-Ended M12 Female Cordsets					
Model	**Length**	**Style**	**Dimensions**	**Pinout (Female)**	
MQDC-406RA	2 m (6.56 ft)	Right-Angle			
MQDC-415RA	5 m (16.4 ft)				
MQDC-430RA	9 m (29.5 ft)				
MQDC-450RA	15 m (49.2 ft)				

Brackets

All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.

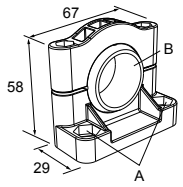
SMB30A
- Right-angle bracket with curved slot for versatile orientation
- Clearance for M6 (¼ in) hardware
- Mounting hole for 30 mm sensor
- 12-gauge stainless steel

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



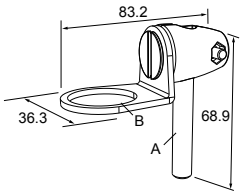
SMB30SC
- Swivel bracket with 30 mm mounting hole for sensor
- Black reinforced thermoplastic polyester
- Stainless steel mounting and swivel locking hardware included

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



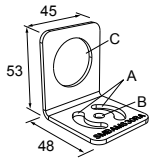
SMB30FA
- Swivel bracket with tilt and pan movement for precise adjustment
- Mounting hole for 30 mm sensor
- 12-gauge 304 stainless steel
- Easy sensor mounting to extrude rail T-slot
- Metric- and inch-size bolt available

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



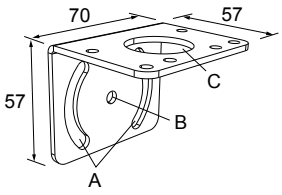
SMBAMS30RA
- Right-angle SMBAMS series bracket
- 30 mm hole for mounting sensors
- Articulation slots for 90°+ rotation
- 12-gauge (2.6 mm) cold-rolled steel

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



SMB30MM
- 12-gauge 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 × 7, B = ø 6.4, C = ø 30.1



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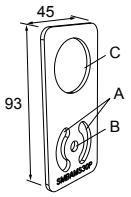
SMBAMS30P

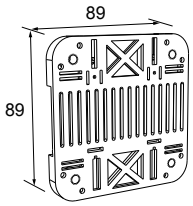
- Flat SMBAMS series bracket
- 30 mm hole for mounting sensors
- Articulation slots for 90°+ rotation
- 12-gauge 300 series stainless steel

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



SMBDX80DIN

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

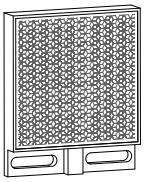


Retroreflective Targets

NOTE: For a complete selection of retroreflective targets, see http://www.bannerengineering.com.

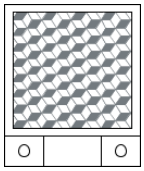
BRT-2X2

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



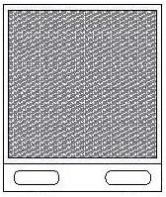
BRT-35X35B

- Square, acrylic target
- Reflectivity Factor: 1.3
- Temperature:
- Approximate size: 35 mm × 35 mm



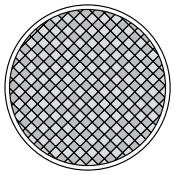
BRT-51X51BM

- Square, acrylic target
- Reflectivity Factor: 1.5
- Temperature:
- 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:
- Optional brackets are available
- Size: 50.8 mm diameter



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BRT-100X18A • Rectangular, acrylic target • Reflectivity factor: 1.4 • Temperature: • Approximate size: 18.5 mm × 120 mm	

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

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