MINI-BEAM®2

Miniature Photoelectric Sensors

Shown Actual Size

MINI-BEAM2 Features

- Designed after the popular MINI-BEAM®, but only one-third the size of the original†.
- 12 mm threaded barrel on most models.
- Uses advanced miniaturized microprocessor-based circuitry.
- Simple setup, using digital push-button sensitivity adjustment.
- Available for opposed, retroreflective, diffuse, and convergent sensing modes.
- 10 to 30V dc operation.
- Complementary outputs (one normally open and one normally closed), each with 150 mA switching capacity.
- IP67 and NEMA 6 environmental ratings.
- Wraparound status indicators.
- Models with either integral, unterminated cable or 150 mm (6") pigtail with 4-pin Pico-style connector.

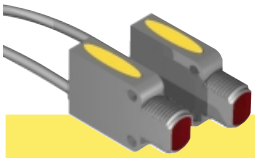
†Patents issued and pending

MINI-BEAM2 Overview

Introduced in 1985, the MINI-BEAM has become the world's most popular miniature photoelectric sensor. With millions in use, MINI-BEAM is now the benchmark for small, self-contained photoelectric sensors. MINI-BEAM2 represents the next generation of these popular sensors.

MINI-BEAM2 is just one-third the size of the original MINI-BEAM. With its impressive sensing performance and small size, the MINI-BEAM2 can mount inside machinery where other self-contained photoelectric sensors will not fit or function.

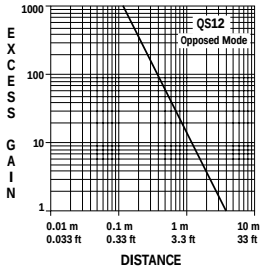
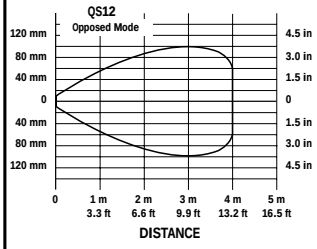
Setting sensitivity is extremely easy using the MINI-BEAM2's incremental adjustment. Just press and hold the push button until maximum gain is reached, then "click" the push button to reduce gain in increments (8 possible settings).



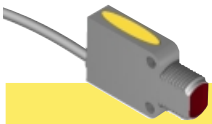
Their small effective beam size is ideal for accuracy-dependent applications. They provide enough excess gain at short range to burn through even contaminated areas and may even sense opaque materials through a thin-walled container.

Visible red, 660 nm

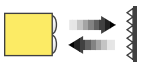
MINI-BEAM2 Opposed-Mode Emitter (E) and Receiver (R)

Models	Range	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
QS126E **QS12VN6R**	4 m (13')	2 m (6.5')	10 to 30V dc	NPN (sinking)		Effective Beam: 5 mm 
QS126EQ **QS12VN6RQ**		4-pin Pico-style Pigtail QD				
QS126E **QS12VP6R**		2 m (6.5')		PNP (sourcing)		
QS126EQ **QS12VP6RQ**		4-pin Pico-style Pigtail QD				

Non-Polarized, Polarized



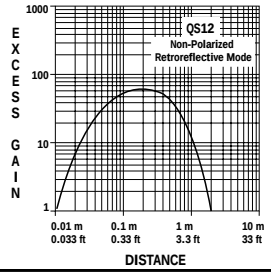
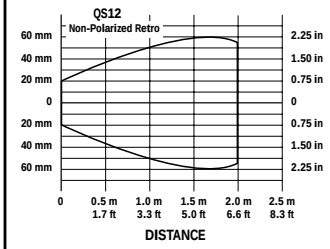
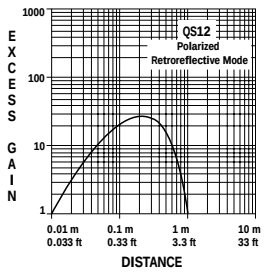
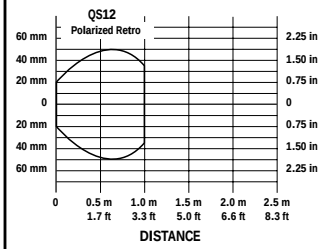
Excellent for sensing relatively small items where opposed-mode sensing is not possible. Recommended for relatively clean environments where substantial excess gain is not required. Polarized models filter out unwanted reflections.

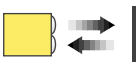


LV: Visible red, 660 nm

LP: Visible red, 680 nm

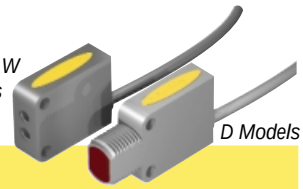
MINI-BEAM2 Retroreflective Sensors

Models	Range**	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
Retroreflective					Performance based on BRT-50 retroreflector	
QS12VN6LV	2 m (6.5')	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6LVQ		4-pin Pico-style Pigtail QD				
QS12VP6LV		2 m (6.5')		PNP (sourcing)		
QS12VP6LVQ		4-pin Pico-style Pigtail QD				
Polarized Retroreflective						
QS12VN6LP	1 m (3')	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6LPQ		4-pin Pico-style Pigtail QD				
QS12VP6LP		2 m (6.5')		PNP (sourcing)		
QS12VP6LPQ		4-pin Pico-style Pigtail QD				



D, DBZ: Visible red, 680 nm
W: Visible red, 660 nm

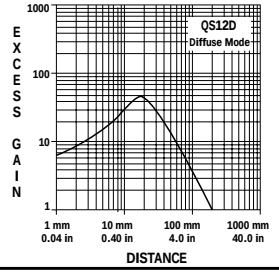
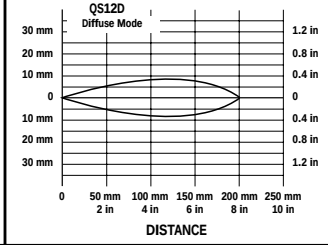
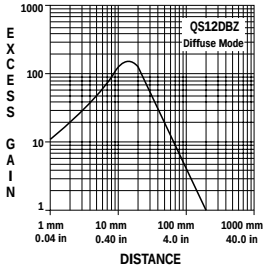
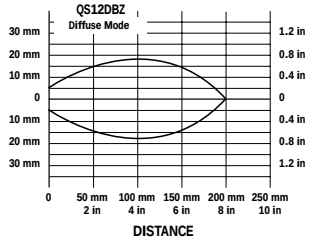
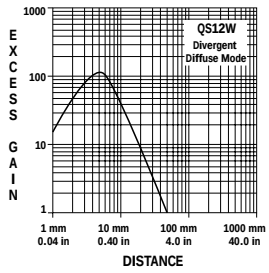
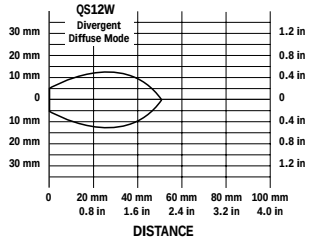
These economical single-unit sensors are excellent for sensing objects of adequate size and reflectivity at short range. Divergent (wide-angle) models are useful for sensing small items and translucent or transparent materials at close range. Models are available with or without the 12 mm threaded front.



DBZ & W Models

D Models

MINI-BEAM2 Diffuse-Mode Sensors

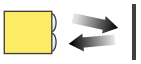
Models	Range	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
Diffuse					Diffuse mode performance based on 90% reflectance white test card	
QS12VN6D	200 mm (8")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6DQ		4-pin Pico-style Pigtail QD				
QS12VP6D		2 m (6.5')		PNP (sourcing)		
QS12VP6DQ		4-pin Pico-style Pigtail QD				
Diffuse (Flush-Front Profile)						
QS12VN6DBZ	200 mm (8")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6DBZQ		4-pin Pico-style Pigtail QD				
QS12VP6DBZ		2 m (6.5')		PNP (sourcing)		
QS12VP6DBZQ		4-pin Pico-style Pigtail QD				
Divergent (Wide-Angle) Diffuse						
QS12VN6W	50 mm (2")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6WQ		4-pin Pico-style Pigtail QD				
QS12VP6W		2 m (6.5')		PNP (sourcing)		
QS12VP6WQ		4-pin Pico-style Pigtail QD				

* 9 m (30') cables are available by adding suffix **"W/30"** to the model number of any cabled sensor (e.g., **QS126E W/30**). A model with a pigtail QD requires a mating cable (see page 7).

** Range specifications for retroreflective and polarized retroreflective sensors are largely dependent on target size and design. Refer to the BANNER Photoelectric Sensors catalog for a full selection of retroreflective targets.

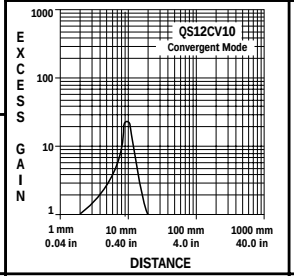
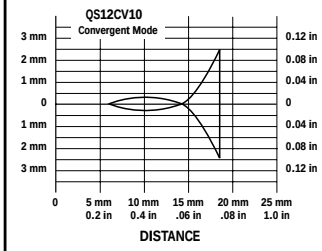
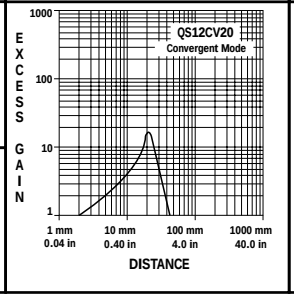
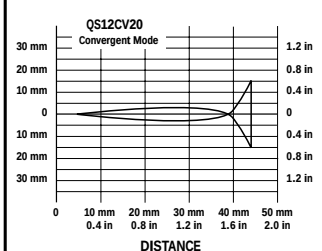
MINI-BEAM®2 – Miniature Photoelectric Sensors

Convergent-mode sensors feature high excess gain and can detect objects of low reflectivity. They also are a good choice for counting radiused objects with no space between them, for accurate position sensing, and for sensing of clear materials that travel near the beam's focus.



Visible red, 660 nm

MINI-BEAM2 Convergent-Mode Sensors

Models	Focus	Cable*	Supply Voltage	Output Type	Excess Gain	Beam Pattern
					Convergent-mode performance based on 90% reflectance white test card	
QS12VN6CV10	10 mm (0.4") **Spot Size at Focus:** 1 mm (0.04")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6CV10Q		4-pin Pico-style Pigtail QD				
QS12VP6CV10		2 m (6.5')		PNP (sourcing)		
QS12VP6CV10Q		4-pin Pico-style Pigtail QD				
QS12VN6CV20	20 mm (0.8") **Spot Size at Focus:** 1.75 mm (0.07")	2 m (6.5')	10 to 30V dc	NPN (sinking)		
QS12VN6CV20Q		4-pin Pico-style Pigtail QD				
QS12VP6CV20		2 m (6.5')		PNP (sourcing)		
QS12VP6CV20Q		4-pin Pico-style Pigtail QD				

* 9 m (30') cables are available by adding suffix **"W/30"** to the model number of any cabled sensor (e.g., **QS12VN6CV10 W/30**). A model with a pigtail QD requires a mating cable (see page 7).

Using the MINI-BEAM2

LED Indicators

MINI-BEAM2 has two bright LEDs; both are visible from the back, and each is visible from one side of the sensor. They indicate the following:

Green steady: Power ON
Amber steady: Light sensed
Green flashing rapidly 5 times: Maximum gain
Single green flash: Push button "click" registered, gain reduced by one increment
Amber/Green alternating: Minimum gain (can not reduce further)

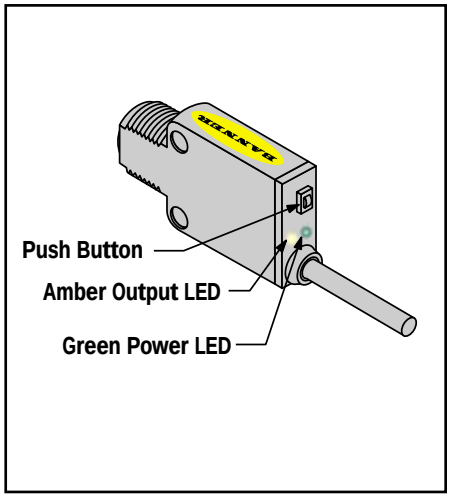


Figure 1. MINI-BEAM2 Features

Setting Sensitivity

MINI-BEAM2 features an extremely simple method for setting sensitivity (gain).

- Simply hold the push button until the green LED flashes rapidly, 5 times. The sensor is automatically set to maximum gain.
- Reduce gain by pressing the push button briefly ("clicking" it) up to 7 times; gain will reduce in single increments with each click. Amber and green LEDs alternate after the lowest setting is reached.
- If gain is accidentally set too low, hold the push button until gain increases to the maximum level, then click the push button down to the appropriate level. Gain may be readjusted in this way at any time.

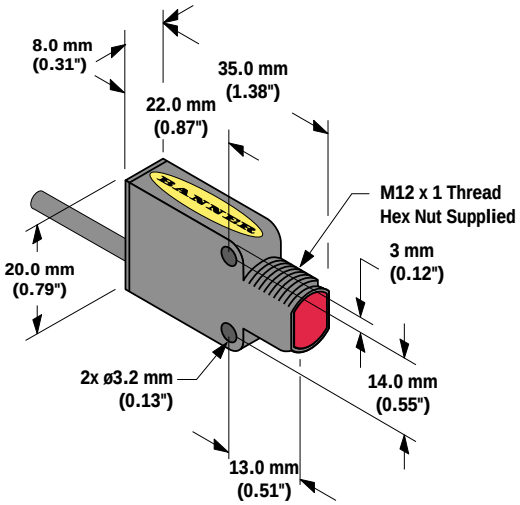
Banner Engineering Corp. • Minneapolis, U.S.A.
Website: http://www.baneng.com • Tel: 888.373.6767

MINI-BEAM2 Specifications

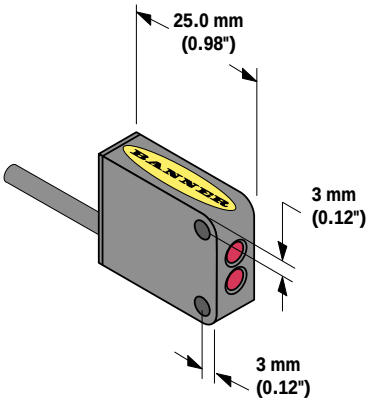
Supply Voltage	10 to 30V dc (10% maximum ripple) at less than 25 mA, exclusive of load
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	Solid state complementary (SPDT): NPN or PNP (current sinking or sourcing) output models available
Output Rating	150 mA maximum each output at 25°C **OFF-state leakage current:** less than 10 µA @ 30V dc **ON-state saturation voltage:** less than 1V @ 10 mA; less than 1.5V @ 150 mA
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs
Output Response	**Opposed Mode**: 8 milliseconds ON, 4 milliseconds OFF **All others:** 1.5 milliseconds NOTE: 500 millisecond delay on power-up, outputs do not conduct during this time
Repeatability	**Opposed Mode:** 1 millisecond **All others:** 175 microseconds
Adjustments	One rubber-sealed push button **Hold:** Maximum gain **Click:** Reduce gain one increment
Indicators	2 LEDs, visible from back and sides of sensor: 1 green, 1 amber **Green steady:** Power ON **Amber steady:** Light sensed **Green flashing rapidly 5 times:** Maximum gain **Single green flash:** Click registered, gain reduced by one increment (total of 8) **Amber/Green alternating:** Minimum gain (can not reduce further)
Construction	Black polycarbonate/ABS alloy housing; totally encapsulated circuitry
Environmental Rating	IEC IP67; NEMA 6
Connections	2 m (6.5') 4-wire PVC cable, 9 m (30') PVC cable, or 4-pin Pico-style 150 mm (6") pigtail QD
Operating Conditions	**Temperature:** -20° to +55° C (-4° to +131° F) **Relative Humidity:** 90% @ 50° C (non-condensing)

MINI-BEAM2 Dimensions

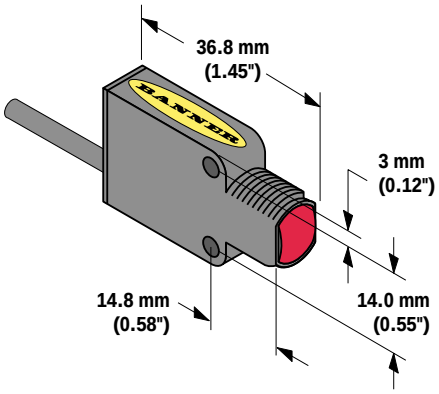
Retroreflective and Diffuse Modes (Model suffix D, LV and LP)



Diffuse and Divergent Diffuse Modes (Model suffix DBZ and W)

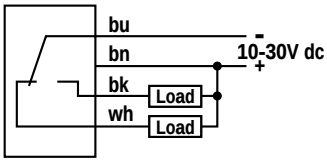


Emitter, Receiver and Convergent Mode (Model suffix E, R abd CV)

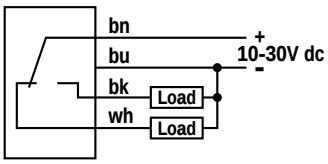


MINI-BEAM2 Hookups

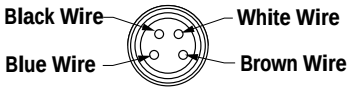
QS12 Sensors with NPN (Sinking) Outputs



QS12 Sensors with PNP (Sourcing) Outputs

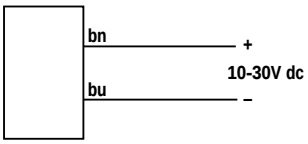


4-Pin Pico-Style Pin-out (Cable Connector Shown)

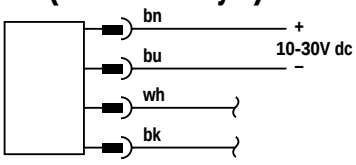


NOTE: Hookups are the same for either an integral or QD cable.

DC Emitters with Attached Cable



DC Emitters with Quick-Disconnect (4 Pin Pico-Style)



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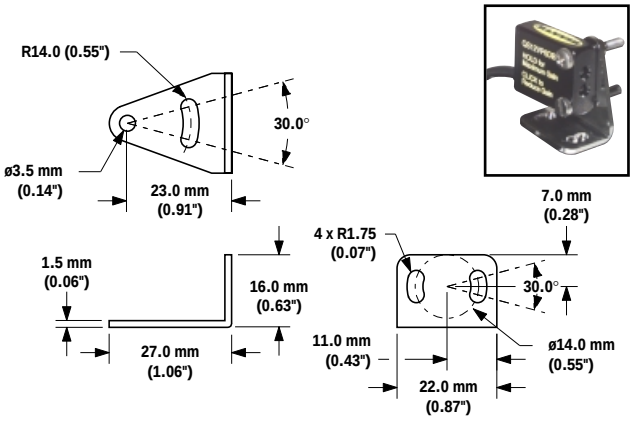
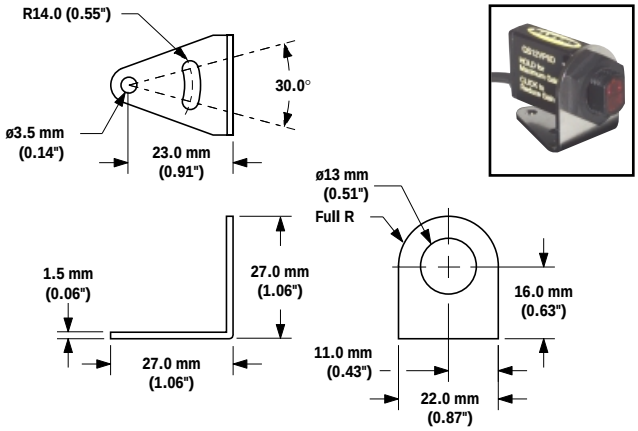
Mounting Brackets

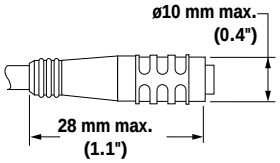
SMBQS12S	• Right-angle bracket, side-mount • 300 series stainless steel, 16 ga.	**SMBQS12PD**	• Right-angle bracket, 12 mm nose-mount • 300 series stainless steel, 16 ga.





Pico-Style Quick-Disconnect Cables

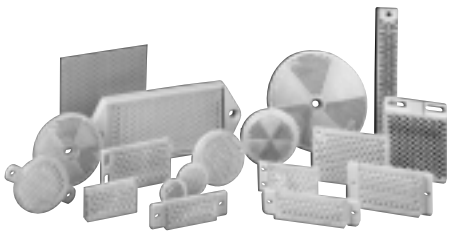
Cable: PUR jacket, polyurethane connector body, POM snap-lock coupling
Conductors: 26 or 24 AWG high-flex stranded, gold-plated contacts
Temperature: -40° to +90°C (-40° to +194°F)
Voltage Rating: 30V ac/36V dc

Style	Model	Length	Dimensions
4-Pin Straight	**PKG4-2**	2 m (6.5')	

Retroreflective Targets

Banner offers a wide selection of high-quality retroreflective targets. See the Accessories section of your current Banner Photoelectric Sensors catalog for complete information.

NOTE: Polarized sensors require corner cube type retroreflective targets only.



the photoelectric specialist

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.

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.