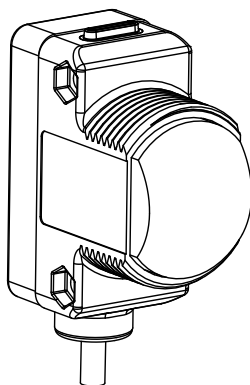


WORLD-BEAM® QS30 Series Sensors

High-power opposed-mode sensors



- Infrared beam with high excess gain — range over 213 m (700')
- Excellent noise immunity
- Excellent optical performance throughout the sensing range
- Easy two frequency selection to help prevent crosstalk, see Application Note on page 3
- Easy-to-read operating status indicators with bargraph display
- Bipolar discrete outputs, PNP and NPN
- Light Operate and Dark Operate models available
- Models available with 2 m or 9 m (6.5' or 30') cable or quick-disconnect fitting
- Tough ABS housing is rated IEC IP67; NEMA 6P; QD models are washdown tested to DIN 40050-9 (IP69K)
- Unique water/debris-shedding lens design reduces lens contamination; lens material survives impact, washdown and cleaning chemicals
- Encapsulated electronics
- Compact housing — mounting versatility via popular 30 mm threaded barrel or side-mount



Excellent for applications where high sensing power is required due to long sensing range or contamination on lenses.

Models

Model	Cable*	Supply Voltage	Output Type
Emitters			
QS30EX	2 m (6.5') 5-wire Cable	10V dc to 30V dc	—
QS30EXQ	5-pin Euro-style QD		
Receivers			
QS30ARX	2 m (6.5') 5-wire Cable	10V dc to 30V dc	Bipolar NPN/PNP Light Operate
QS30ARXQ	5-pin Euro-style QD		
QS30RRX	2 m (6.5') 5-wire Cable		Bipolar NPN/PNP Dark Operate
QS30RRXQ	5-pin Euro-style QD		

* 9 m (30') cables are available by adding suffix **W/30** to the model number of any cabled sensor (for example, **QS30EX W/30**). A model with a QD connector requires a mating cable (see [Cordsets](#) on page 4).

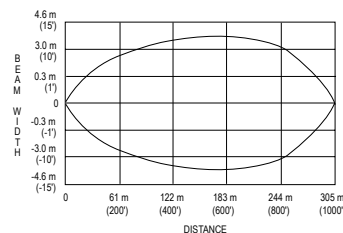


Figure 1. Beam Pattern

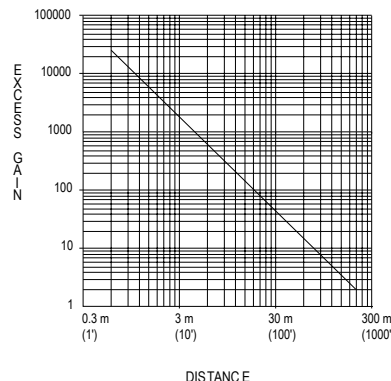


Figure 2. Excess Gain



WARNING: Not To Be Used for Personnel Protection

Never use this product as a sensing device for personnel protection. Doing so could lead to serious injury or death. This product 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

Banner QS30 Series high-power opposed-mode sensors are extremely rugged, powerful and leakproof. They are designed to withstand the most demanding industrial applications, including high-pressure washdown areas. They are powerful enough to burn through heavy fog, dust, and most types of industrial and process contamination.

The sensor's electronics are epoxy-encapsulated for maximum resistance to mechanical shock and vibration. The popular WORLD-BEAM-style housing provides multiple mounting configurations in a minimum of space.

The innovative circuitry used in these sensors provides the best EMI/RFI noise immunity of any non-synchronized emitter/receiver pair. For applications where optical crosstalk between multiple sensor pairs may be a problem, the sensors provide a choice between two frequencies (A and B). (Each emitter must be set to the same frequency as its receiver, see [Sensor Alignment](#) on page 2.)

Light Operate and Dark Operate outputs are available, depending on the model. Each model has two outputs that switch simultaneously: one each NPN (sinking) and PNP (sourcing).

Additional configuration options are available; contact the factory for information about the following options:

- Additional modulation frequency choices (up to four)
- Modified sensor gain
- ON-delay or OFF-delay settings
- Fixed modulation frequency models

Each sensor has a green Power ON/OFF indicator and yellow indicators for the selected modulation frequency. In addition, receivers have a yellow LED that lights when the outputs are conducting, plus a 4-element light bar that indicates signal strength, relative to the switch point (the higher the number lit, the more light is received).

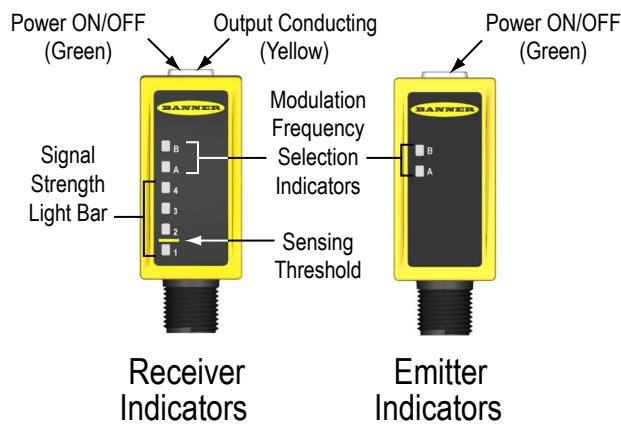


Figure 3. Receiver and Emitter Indicators

Sensor Configuration

The modulation frequency (A or B) is selected by the state of the gray wire (on cabled models; pin 5 on QD models – see hookups...). A “+” voltage or no connection selects frequency A; connecting it to “-” selects frequency B.

To disable (or inhibit) the emitter LED for testing the receiver, attach the white wire to “-” voltage.

Sensor Alignment

Adjust the emitter first, then the receiver. Verify that both sensors are wired for the same modulation frequency, then adjust the emitter's position until the receiver signal strength light bar indicates its highest amount of signal received (the highest number lit). Tighten the emitter mounting hardware, then repeat the process for the receiver.

To achieve the best crosstalk immunity, position a single matched emitter within the receiver's field of view (15 degrees). When it is necessary to position an alternate emitter in the receiver's field of view, sensor alignment is required to ensure the matched frequency emitter provides the stronger signal to its receiver, and the alternate frequency emitter does not reduce the signal strength of the receiver (as indicated by the 4-element signal strength light).

Specifications

Supply Voltage and Current

Emitter: 10 to 30V dc (10% maximum ripple) at less than 70 mA

Receiver: 10 to 30V dc (10% maximum ripple) at less than 22 mA (exclusive of load)

Beam

875 nm, infrared

Sensing Range

Excess gain of 2 at 213 m (700')

Output Configuration

Bipolar current sinking (NPN) white wire; current sourcing (PNP) black wire

Output Rating:

100 mA max

OFF-state leakage current: less than 200 μ A

ON-state saturation voltage: less than 1.5V @ 100 mA, less than 900 millivolts at 10 mA

Protected against false power-up and continuous overload or short circuit of outputs

Output Response

30 milliseconds ON and 30 milliseconds OFF; 5 ms repeatability

Adjustments

Light Operate/Dark Operate — dependent on model selected

Frequency via gray wire

A: Gray (+)

B: Gray (-)

Emitter only: LED inhibit via white wire White (-) turns emitter LED OFF (to allow verification of sensor operation)

Indicators

Green LED: Power ON

Frequency indicator (A or B)

Receiver only:

Yellow LED: Output conducting

4-LED Signal Strength light bar

Environmental Rating

Cabled models: IP67, NEMA 6P

QD models: IP69K per DIN 40050-9

Construction

ABS plastic housing; impact-resistant lens material

Connection

5-wire cable (2 m or 9 m) or 5-pin integral Euro-style quick-disconnect fitting

Operating Conditions

Temperature: -20° to +60° C (-4° to +140° F)

Relative Humidity: 90%; non-condensing

Mounting Torque

Maximum 4.5 Nm (40 in lbs) with included 30 mm mounting nut

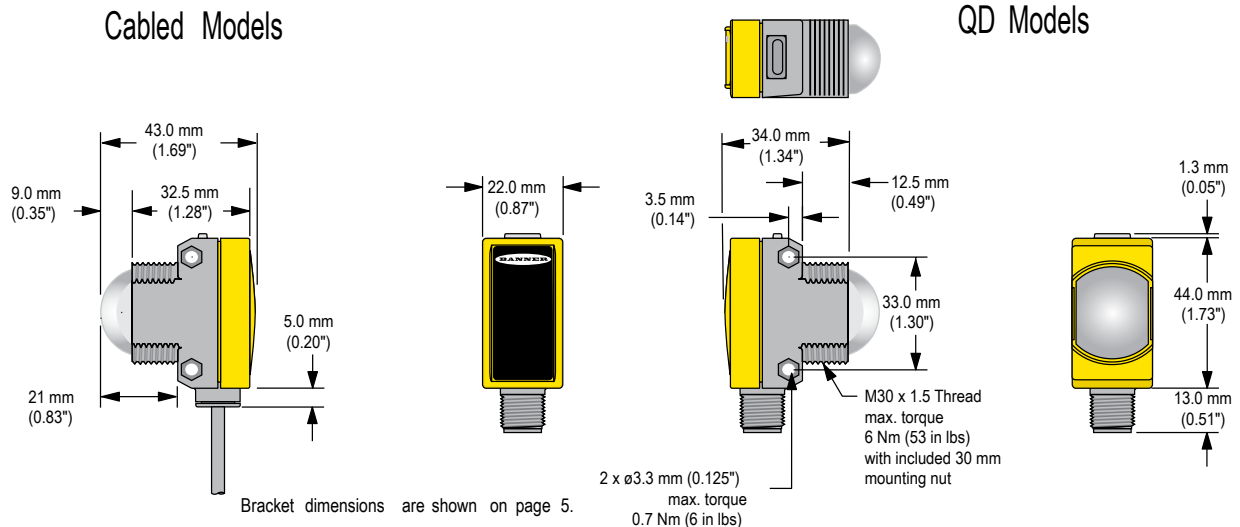
Certifications



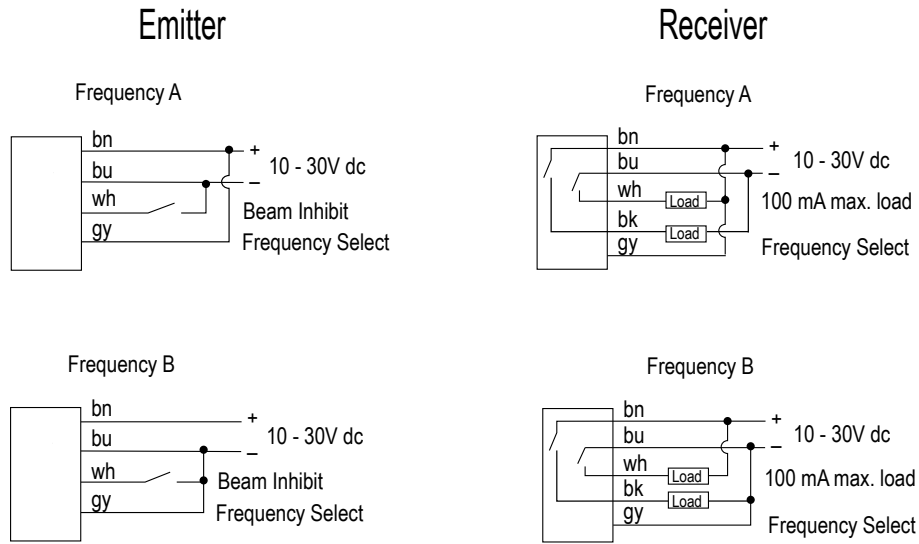
Application Notes

1. When multiple sensors are used in close proximity (see Figure 1 for separation distance), position sensors such that the alternate frequency emitter is not within the receiver's field of view. Contact the Banner Application team for additional information.
2. Prolonged outdoor use in direct sunlight may cloud the lens. Contact Banner for other outdoor solutions.

Dimensions



Wiring



Accessories

Cordsets

Quick Disconnect		
<p>5-Pin M12/Euro-Style Cordsets (straight connector)</p> <p>MQDC1-506, 2 m (6')</p> <p>MQDC1-515, 5 m (15')</p> <p>MQDC1-530, 9 m (30')</p>		
<p>5-Pin M12/Euro-Style Cordsets (right-angle connector)</p> <p>MQDC1-506RA, 2 m (6')</p> <p>MQDC1-515RA, 5 m (15')</p> <p>MQDC1-530RA, 9 m (30')</p>		

Brackets

<p>SMBQS30L</p>	<ul style="list-style-type: none"> • 14-gauge, stainless steel right-angle bracket for cable models • Clearance for M4 (#8) hardware • ± 12° tilt adjustment 	<p>SMBQS30LT</p>	<ul style="list-style-type: none"> • 14-gauge stainless steel for QD models with right-angle cables • Tall right-angle mounting bracket • ± 8° Tilt adjustment
<p>SMBQS30Y</p>	<ul style="list-style-type: none"> • Heavy-duty die-cast bracket • M18 vertical mounting option • ± 8° tilt adjustment with cabled units • Nuts and lockwasher included 	<p>SMB30SC</p>	<ul style="list-style-type: none"> • 130 mm swivel bracket, barrel mount • Black reinforced thermoplastic polyester • Includes stainless steel mounting and swivel locking hardware

Other Compatible Mounting Brackets (see Banner Photoelectric catalog or website for more information):

- SMB30MM
- SMB30A

Contact Us

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Banner Engineering Corp Limited Warranty

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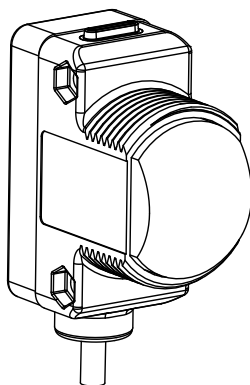
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Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp.

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- Bipolar discrete outputs, PNP and NPN
- Light Operate and Dark Operate models available
- Models available with 2 m or 9 m (6.5' or 30') cable or quick-disconnect fitting
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- Unique water/debris-shedding lens design reduces lens contamination; lens material survives impact, washdown and cleaning chemicals
- Encapsulated electronics
- Compact housing — mounting versatility via popular 30 mm threaded barrel or side-mount



Excellent for applications where high sensing power is required due to long sensing range or contamination on lenses.

Models

Model	Cable*	Supply Voltage	Output Type
Emitters			
QS30EX	2 m (6.5') 5-wire Cable	10V dc to 30V dc	—
QS30EXQ	5-pin Euro-style QD		
Receivers			
QS30ARX	2 m (6.5') 5-wire Cable	10V dc to 30V dc	Bipolar NPN/PNP Light Operate
QS30ARXQ	5-pin Euro-style QD		
QS30RRX	2 m (6.5') 5-wire Cable		Bipolar NPN/PNP Dark Operate
QS30RRXQ	5-pin Euro-style QD		

* 9 m (30') cables are available by adding suffix **W/30** to the model number of any cabled sensor (for example, **QS30EX W/30**). A model with a QD connector requires a mating cable (see [Cordsets](#) on page 4).

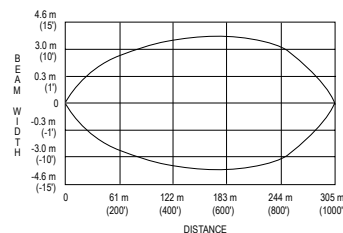


Figure 1. Beam Pattern

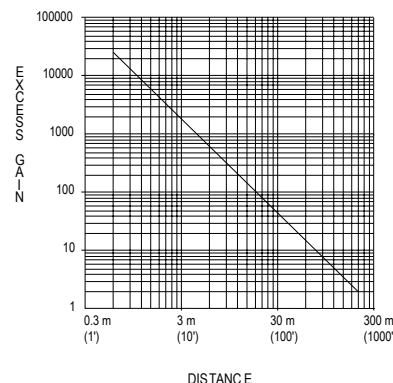


Figure 2. Excess Gain



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The innovative circuitry used in these sensors provides the best EMI/RFI noise immunity of any non-synchronized emitter/receiver pair. For applications where optical crosstalk between multiple sensor pairs may be a problem, the sensors provide a choice between two frequencies (A and B). (Each emitter must be set to the same frequency as its receiver, see [Sensor Alignment](#) on page 2.)

Light Operate and Dark Operate outputs are available, depending on the model. Each model has two outputs that switch simultaneously: one each NPN (sinking) and PNP (sourcing).

Additional configuration options are available; contact the factory for information about the following options:

- Additional modulation frequency choices (up to four)
- Modified sensor gain
- ON-delay or OFF-delay settings
- Fixed modulation frequency models

Each sensor has a green Power ON/OFF indicator and yellow indicators for the selected modulation frequency. In addition, receivers have a yellow LED that lights when the outputs are conducting, plus a 4-element light bar that indicates signal strength, relative to the switch point (the higher the number lit, the more light is received).

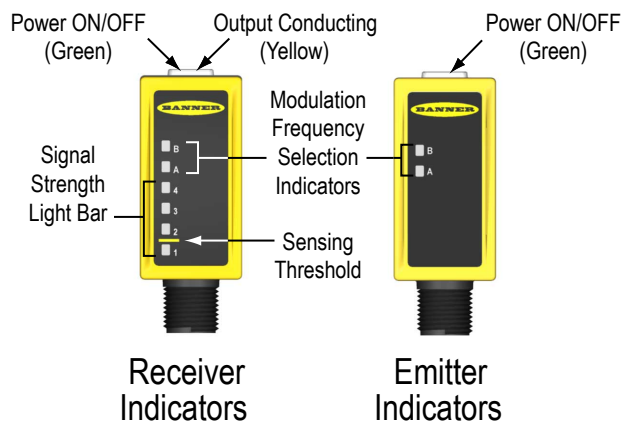


Figure 3. Receiver and Emitter Indicators

Sensor Configuration

The modulation frequency (A or B) is selected by the state of the gray wire (on cabled models; pin 5 on QD models – see hookups...). A “+” voltage or no connection selects frequency A; connecting it to “-” selects frequency B.

To disable (or inhibit) the emitter LED for testing the receiver, attach the white wire to “-” voltage.

Sensor Alignment

Adjust the emitter first, then the receiver. Verify that both sensors are wired for the same modulation frequency, then adjust the emitter's position until the receiver signal strength light bar indicates its highest amount of signal received (the highest number lit). Tighten the emitter mounting hardware, then repeat the process for the receiver.

To achieve the best crosstalk immunity, position a single matched emitter within the receiver's field of view (15 degrees). When it is necessary to position an alternate emitter in the receiver's field of view, sensor alignment is required to ensure the matched frequency emitter provides the stronger signal to its receiver, and the alternate frequency emitter does not reduce the signal strength of the receiver (as indicated by the 4-element signal strength light).

Specifications

Supply Voltage and Current

Emitter: 10 to 30V dc (10% maximum ripple) at less than 70 mA

Receiver: 10 to 30V dc (10% maximum ripple) at less than 22 mA (exclusive of load)

Beam

875 nm, infrared

Sensing Range

Excess gain of 2 at 213 m (700')

Output Configuration

Bipolar current sinking (NPN) white wire; current sourcing (PNP) black wire

Output Rating:

100 mA max

OFF-state leakage current: less than 200 μ A

ON-state saturation voltage: less than 1.5V @ 100 mA, less than 900 millivolts at 10 mA

Protected against false power-up and continuous overload or short circuit of outputs

Output Response

30 milliseconds ON and 30 milliseconds OFF; 5 ms repeatability

Adjustments

Light Operate/Dark Operate — dependent on model selected

Frequency via gray wire

A: Gray (+)

B: Gray (-)

Emitter only: LED inhibit via white wire White (-) turns emitter LED OFF (to allow verification of sensor operation)

Indicators

Green LED: Power ON

Frequency indicator (A or B)

Receiver only:

Yellow LED: Output conducting

4-LED Signal Strength light bar

Environmental Rating

Cabled models: IP67, NEMA 6P

QD models: IP69K per DIN 40050-9

Construction

ABS plastic housing; impact-resistant lens material

Connection

5-wire cable (2 m or 9 m) or 5-pin integral Euro-style quick-disconnect fitting

Operating Conditions

Temperature: -20° to +60° C (-4° to +140° F)

Relative Humidity: 90%; non-condensing

Mounting Torque

Maximum 4.5 Nm (40 in lbs) with included 30 mm mounting nut

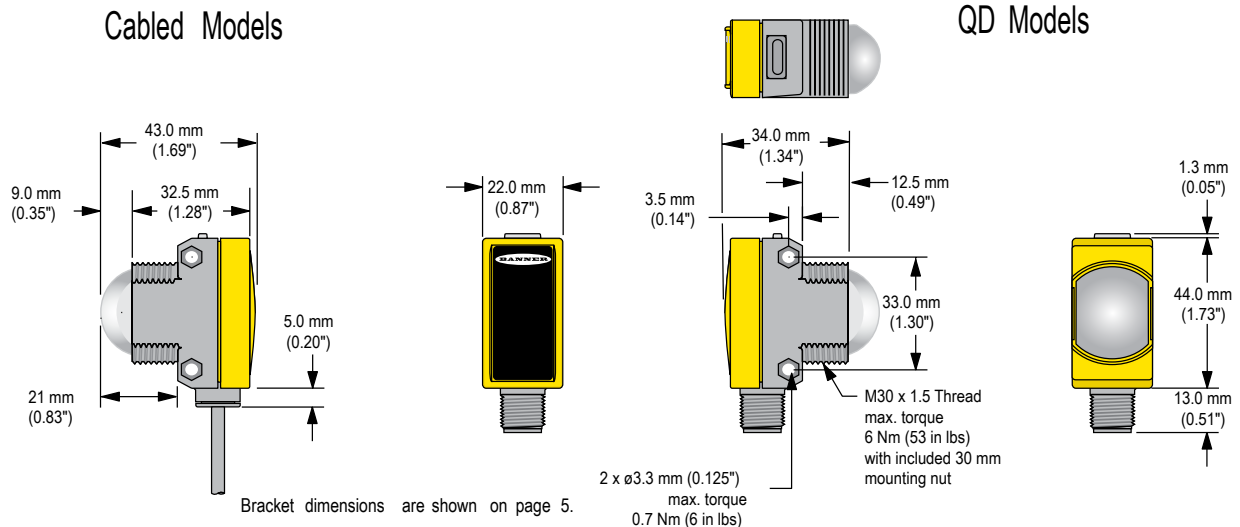
Certifications



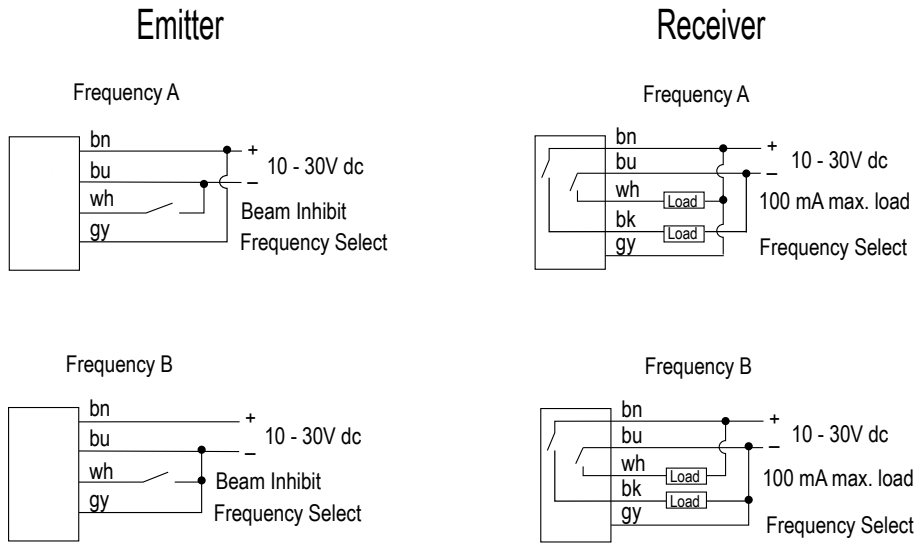
Application Notes

1. When multiple sensors are used in close proximity (see Figure 1 for separation distance), position sensors such that the alternate frequency emitter is not within the receiver's field of view. Contact the Banner Application team for additional information.
2. Prolonged outdoor use in direct sunlight may cloud the lens. Contact Banner for other outdoor solutions.

Dimensions



Wiring



Accessories

Cordsets

Quick Disconnect		
<p>5-Pin M12/Euro-Style Cordsets (straight connector)</p> <p>MQDC1-506, 2 m (6')</p> <p>MQDC1-515, 5 m (15')</p> <p>MQDC1-530, 9 m (30')</p>		
<p>5-Pin M12/Euro-Style Cordsets (right-angle connector)</p> <p>MQDC1-506RA, 2 m (6')</p> <p>MQDC1-515RA, 5 m (15')</p> <p>MQDC1-530RA, 9 m (30')</p>		

Brackets

<p>SMBQS30L</p>	<ul style="list-style-type: none"> • 14-gauge, stainless steel right-angle bracket for cable models • Clearance for M4 (#8) hardware • $\pm 12^\circ$ tilt adjustment 	<p>SMBQS30LT</p>	<ul style="list-style-type: none"> • 14-gauge stainless steel for QD models with right-angle cables • Tall right-angle mounting bracket • $\pm 8^\circ$ Tilt adjustment
<p>SMBQS30Y</p>	<ul style="list-style-type: none"> • Heavy-duty die-cast bracket • M18 vertical mounting option • $\pm 8^\circ$ tilt adjustment with cabled units • Nuts and lockwasher included 	<p>SMB30SC</p>	<ul style="list-style-type: none"> • 130 mm swivel bracket, barrel mount • Black reinforced thermoplastic polyester • Includes stainless steel mounting and swivel locking hardware

Other Compatible Mounting Brackets (see Banner Photoelectric catalog or website for more information):

- SMB30MM
- SMB30A

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Banner Engineering Corp Limited Warranty

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