

Архангельск (8182)63-90-72  
Астана (7172)727-132  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89  
Иваново (4932)77-34-06

Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Липецк (4742)52-20-81  
Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Казахстан (772)734-952-31

Пермь (342)205-81-47  
Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Таджикистан (992)427-82-92-69

Сургут (3462)77-98-35  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

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New Products

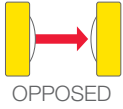



































# Sensors

Banner Engineering has a wide variety of sensors to solve challenging problems all over the world. New and innovative technology in photoelectrics, laser distance measurement, ultrasonics, and fiber optics work to solve almost any industrial automation application.







# Selection Guide | Photoelectric – Opposed




























The sensor's emitter and receiver are housed in two separate units. The emitter is placed opposite the receiver. An object is detected when it breaks the effective beam.

Series	Max Sensing Distance	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 QS18	20 m	10-30 V dc 20-140 V ac/dc 20-270 V ac/dc	35 x 15 (D varies by model)	 	34
 QS30	213 m	10-30 V dc 12-250 V ac/dc 24-250 V ac/dc	44 x 22 (D varies by model)	 	35
 Q12	2 m	10-30 V dc	23 x 8 x 12		36
 Q20	20 m	10-30 V dc	35 x 15 x 31		36
 T18-2	20 m	10-30 V dc 20-250 V ac	DC: 42 x 30 x 30 AC: 52 x 30 x 30	 	20
 VS8	3 m	10-30 V dc	21.5 x 8 x 14.6	 	22
 Q45	60 m	10-30 V dc 90-250 V ac 12-250 V ac/dc 5-15 V dc (NAMUR)	88 x 45 x 55		
 MINI-BEAM	30 m	10-30 V dc 24-240 V ac 5-15 V dc (NAMUR)	31 x 12 (D varies by model)	  	
 Q25	20 m	10-30 V dc 20-250 V ac	50 x 25 x 30	 	
 Q40	60 m	10-30 V dc 20-250 V ac	70 x 40 x 46	 	

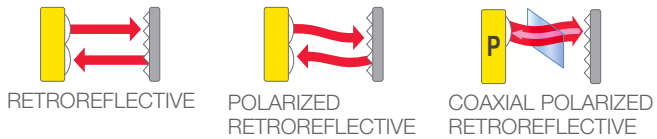
**KEY**

-  Clear Object
-  Washdown
-  Fast Speed  
≤ 500 μs
-  High Precision
-  Long Range
-  Laser



























Series	Max Sensing Distance	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 TM18	20 m	10-30 V dc	41 x 30 x 30		
 T30	60 m	10-30 V dc 20-250 V ac	52 x 40 x 45		
 M12	5 m	10-30 V dc	ø 12 x 67.5		
 S12 S12-2	20 m 25 m	10-30 V dc	ø 12 x 34		
 S18 S18-2	20 m	10-30 V dc 20-250 V ac	DC: ø 18 x 69 AC: ø 18 x 81		
 M18 M18-3 M18-4	20 m 25 m 25 m	10-30 V dc	ø 18 x 59 ø 18 x 88 ø 18 x 88		
 SM30	150 m	10-30 V dc 24-240 V ac	ø 30 x 99		
 VS2	3 m	10-30 V dc	25 x 12 x 4		
 QM26	8.5 m	10-30 V dc	45 x 14 x 25		








# Selection Guide | Photoelectric – Retroreflective





































The sensor contains both the emitter and receiver elements. The effective beam is established by the size of the retroreflector. As with an opposed-mode sensor, an object is sensed when it interrupts or breaks the effective beam.

Series	Max Sensing Distance	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 QS18	Retro: 6.5 m Polar Retro: 3.5 m	10-30 V dc 20-140 V ac/dc 20-270 V ac/dc	35 x 15 x 31	  	34
 QS30	Retro: 12 m Polar Retro: 8 m	10-30 V dc 12-250 V ac/dc 24-250 V ac/dc	44 x 22 x 35	  	35
 Q12	Retro: 1.5 m Polar Retro: 1 m	10-30 V dc	23 x 8 x 12		36
 Q20	Retro: 6 m Polar Retro: 4 m	10-30 V dc	35 x 15 x 31		36
 T18-2	Retro: 2 m Polar Retro: 2 m	10-30 V dc 20-250 V ac	DC: 42 x 30 x 30 AC: 52 x 30 x 30		20
 MINI-BEAM	Retro: 5 m Polar Retro: 3 m	10-30 V dc 24-240 V ac 5-15 V dc (NAMUR)	31 x 12 (D varies by model)	 	
 Q25	Polar Retro: 2 m	10-30 V dc 20-250 V ac	50 x 25 x 30		
 Q40	Polar Retro: 6 m	10-30 V dc 20-250 V ac	70 x 40 x 46		
 Q45	Retro: 9 m Polar Retro: 6 m	10-30 V dc 90-250 V ac 24-250 V ac/dc 12-250 V ac/dc 5-15 V dc (NAMUR)	88 x 45 x 55		
 QMT42	Polar Retro: 3 m	10-30 V dc	58 x 18 x 42		

**KEY**





				
Clear Object	Washdown	Fast Speed ≤ 500 μs	High Precision	Long Range

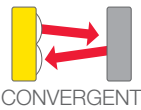
Series	Max Sensing Distance	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 VS8	Retro: 2 m	10-30 V dc	21.5 x 8 x 14.6		
 TM18	Polar Retro: 5.5 m	10-30 V dc	41 x 30 x 30		
 T30	Polar Retro: 6 m	10-30 V dc 20-250 V ac	52 x 40 x 45		
 M12	Retro: 2.5 m Polar Retro: 1.5 m	10-30 V dc	ø 12 x 67.5	 	
 S18 S18-2	Retro: 2 m Polar Retro: 2 m	10-30 V dc 20-250 V ac	DC: ø 18 x 69 AC: ø 18 x 81		
 M18 M18-3 M18-4	Retro: 2 m Polar Retro: 2 m	10-30 V dc	ø 18 x 59		
 QM26	Polar Retro: 3 m	10-30 V dc	45 x 14 x 25	  	
 Q26	Polar Retro: 800 mm	10-30 V dc	52 x 14 x 25		
 QMH26	Polar Retro: 3 m Coaxial Polar Retro: 2.6 m	10-30 V dc	48.5 x 14 x 25	  	
 VS3	Polar Retro: 250 mm	10-30 V dc	25 x 12 x 4		

# Selection Guide | Photoelectric – Miscellaneous











Light from the emitter strikes a surface of an object at some arbitrary angle and is diffused from the surface at all angles. The emitted beam and receiver's field-of-view are very wide.






Series	Max Sensing Distance	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 MINI-BEAM	130 mm	10-30 V dc 24-240 V ac 5-15 V dc (NAMUR)	31 x 12 (D varies by model)		
 QS18	300 mm	10-30 V dc	35 x 15 x 31		34

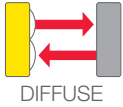


Uses additional optics to create a small, intense and well-defined spot at a fixed distance from the front of the sensor lens.

Series	Max Sensing Distance	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 MINI-BEAM	100 m	10-30 V dc 24-240 V ac 5-15 V dc (NAMUR)	31 x 12 (D varies by model)		
 QS18	43 mm	10-30 V dc	35 x 15 x 31	 IO-Link®	34
 Q45	49 mm	10-30 V dc 90-250 V ac 24-250 V ac/dc 12-250 V ac/dc 5-15 V dc (NAMUR)	88 x 45 x 55		
 VS1	15 mm	10-30 V dc	25.7 x 8.3 x 11.6		
 VS2	15 mm	10-30 V dc	25 x 12 x 4.3		

**KEY**

 Clear Object	 Washdown	 Fast Speed ≤ 500 μs	 High Precision	 Long Range
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









Light from the emitter strikes a surface of an object at some arbitrary angle and is diffused from the surface at all angles.

Series	Max Sensing Distance	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 Q4X	600 mm	10-30 V dc 20-140 V ac/dc 20-270 V ac/dc	35 x 15 (D varies by model)		28
 Q3X	300 mm	10-30 V dc	35 x 18 x 35		
 QS18	800 mm	10-30 V dc 20-140 V ac/dc 20-270 V ac/dc	35 x 15 (D varies by model)		34
 QS30	1.4 m	10-30 V dc 12-250 V ac/dc 24-250 V ac/dc	44 x 22 (D varies by model)		35
 Q20	1.5 m	10-30 V dc	35 x 15 x 31		
 T18-2	500 mm	10-30 V dc	42 x 30 x 30		20
 Q45	3 m	10-30 V dc 90-250 V ac 12-250 V ac/dc 5-15 V dc (NAMUR)	88 x 45 x 55		
 MNI-BEAM	380 mm	10-30 V dc 24-240 V ac 5-15 V dc (NAMUR)	31 x 12 (D varies by model)		
 TM18	500 mm	10-30 V dc	41 x 30 x 30		
 S18 S18-2	300 mm	10-30 V dc or 20-250 V ac	DC: ø 18 x 69 AC: ø 18 x 81		
 M18 M18-3 M18-4	300 mm	10-30 V dc	ø 18 x 59		
 M12	400 mm	10-30 V dc	ø 12 x 67.5		

# Selection Guide | Laser Measurement Sensors



Laser measurement sensors from Banner Engineering solve a wide variety of discrete sensing applications. A discrete sensor's output is either on or off.

Series	Sensing Range	Repeatability (mm)	Minimum Object Separation (mm)	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 LM	50 to 150 mm	±0.002	0.12 to 0.14	48.5 x 23.5 x 35.8	     IO-Link®	26
 Q4X100 Q4X300 Q4X500 Q4X600	25 to 100 mm 25 to 300 mm 25 to 500 mm 25 to 600 mm	±0.2 ±0.5 to 3.0 ±0.5 to 5.0 ±0.5 to 3.0	0.5 to 1.0 1.0 to 13.5 1.0 to 30.0 1.0 to 10.0	57.4 x 18 x 43.6	   IO-Link®	28
 Q4XF	35 to 110 mm 35 to 310 mm 35 to 610 mm	±0.2 ±0.5 to 3.0 ±0.5 to 3.0	0.5 to 1.0 1.0 to 13.5 1.0 to 10.0	57.4 x 18 x 32.5	   IO-Link®	28
 LE250 LE550	100 to 400 mm 100 to 1 m	±0.01 to 0.1 ±0.125 to 0.5	0.5 to 1.0 2.0 to 8.0	60 x 26 x 56	  IO-Link®	30
 LTF12 LTF24	50 mm to 12 m 50 mm to 24 m	±0.45 to 4.5 ±0.45 to 6.0	1.8 to 18.0 1.8 to 24.0	77 x 26 x 56	  IO-Link®	32
 Q5X	9.5 cm to 2 m	±0.5 to 10.0	±1.0 to 35.0	60 x 25 x 52	  IO-Link®	24
 LT3	Retro: 500 mm to 50 m	±5.0 to 6.0		68.5 x 35.3 x 87		
 LT7	Retro: 500 mm to 250 m	±2.0		93 x 42 x 95		






## Repeatability

How reliably a sensor can repeat the same measurement in the same conditions. Repeatability of 0.5 mm means that multiple measurements of the same target will be within ± 0.5 mm.

## Minimum Object Separation (MOS)














The minimum distance a target must be from the background to be reliably detected by a sensor. A MOS of 0.5 mm means the sensor can reliably detect an object that is at least 0.5 mm from the background.

**KEY**

				
Clear Object	Washdown	Fast Speed ≤ 500 μs	High Precision	Long Range



Laser measurement sensors from Banner Engineering solve a wide variety of analog applications. Analog sensors display the output value as either a function of voltage or current.

Series	Sensing Range	Resolution (mm)	Linearity (mm)	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 LM	50 to 150 mm	0.004	$\pm 0.060$ to $\pm 0.070$	48.5 x 23.5 x 35.8		26
 LH30 LH80 LH150	50 to 35 mm 50 to 100 mm 50 to 200 mm	0.001 0.004 0.01	$\pm 0.01$ $\pm 0.04$ $\pm 0.1$	80 x 32 x 65		
 Q4X100 Q4X300 Q4X500	25 to 100 mm 25 to 300 mm 25 to 500 mm	0.15 0.3 to 1.0 0.3 to 1.75	$\pm 0.25$ to 1.0 $\pm 0.8$ to 9.0 $\pm 0.8$ to 25.0	57.4 x 18 x 43.6		28
 Q4XF	35 to 110 mm 35 to 310 mm	0.15 0.3 to 1.0	$\pm 0.25$ to 1.0 $\pm 0.8$ to 9.0	57.4 x 18 x 32.5		28
 LE250 LE550	100 to 400 mm 100 mm to 1 m	0.02 to 0.2 0.5 to 1.0	$\pm 0.375$ to 0.9 $\pm 2.0$ to 4.5	60 x 26 x 56		30
 LTF12 LTF24	50 mm to 12 m 50 mm to 24 m	0.9 to 9.0 0.9 to 12.0	$\pm 10.0$ $\pm 25.0$	77 x 26 x 56		32

#### Resolution

The smallest change in distance a sensor can detect. A resolution of 0.5 mm means that the sensor can detect changes in distance of 0.5 mm.

#### Linearity

How closely a sensor's analog output approximates a straight line across the measuring range. The more linear the sensor's measurements, the more consistent the measurements across the full range of the sensor. Linearity of 0.5 mm means that the greatest variation in measurement across the sensor's range is  $\pm 0.5$  mm.








# Selection Guide | Ultrasonic Sensors

Ultrasonic sensors use sound waves rather than light, making them ideal for stable detection of uneven surfaces, liquids, clear objects, and objects in dirty environments. These sensors work well for applications that require precise measurements between stationary and moving objects.










Series	Sensing Range	Analog Resolution or Discrete Repeatability	Output Configuration	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 QT50U	200 mm to 8 m	1.0 mm	SPDT Electromagnetic Relay Dual Discrete Both NPN or Both PNP Analog 0 to 10 V dc or 4 to 20 mA	84.2 x 74.1 x 67.4		
 S18U	30 to 300 mm	Discrete: 0.5 mm Analog: Fast 2.5 mm Slow 0.5 mm	Discrete Bipolar NPN/PNP Analog/Discrete NPN or PNP 0 to 10 V dc or 4 to 20 mA	ø 18 x 80.8		
 T30UX	100 mm to 1 m 200 mm to 2 m 300 mm to 3 m	0.1% of sensing distance A models: 0.5 mm minimum B models: 1.0 mm minimum C models: 1.5 mm minimum	Discrete NPN or PNP NO or NC Analog 0 to 10 V dc or 4 to 20 mA	51.5 x 40 x 45		
 T30U	150 mm to 1 m 300 mm to 2 m	0.25% of sensing distance	Dual Discrete Both NPN or Both PNP Analog 0 to 10 V dc or 4 to 20 mA	51.5 x 40 x 45		
 M25U	250 or 500 mm		Discrete Bipolar NPN/PNP	ø 25 x 103		
 T18U	300 or 600 mm		Complimentary NPN or PNP (1 NO, 1 NC)	51.5 x 40 x 30		
 Q45U	100 mm to 1.4 m 250 mm to 3 m	Short: 0.1% of sensing distance (0.25 mm minimum) Long: 0.1% of sensing distance (0.5 mm minimum)	Discrete Bipolar NPN/PNP Analog 0 to 10 V dc or 4 to 20 mA	87.6 x 44.5 x 60.5		
 Q45UR	50 mm to 250 mm	0.2% of sensing distance	Discrete Bipolar NPN/PNP Analog 0 to 10 V dc or 4 to 20 mA	87.6 x 44.5 x 60.5		
 QS18U	50 to 500 mm	0.7 mm	Discrete NPN or PNP	41.5 x 15 x 33.5		
 K50U	100 mm to 1 m 300 mm to 3 m	0.1 % of sensing distance (1.5 mm minimum)	Discrete RS-285 1-wire serial	ø 50 x 59.5	• Compatible with Banner Wireless	

**KEY**

-  Pump In  
Pump Out
-  Temp  
Comp
-  Chemical  
Resistant
-  Vibration
-  Washdown

# Temperature and Vibration Sensors

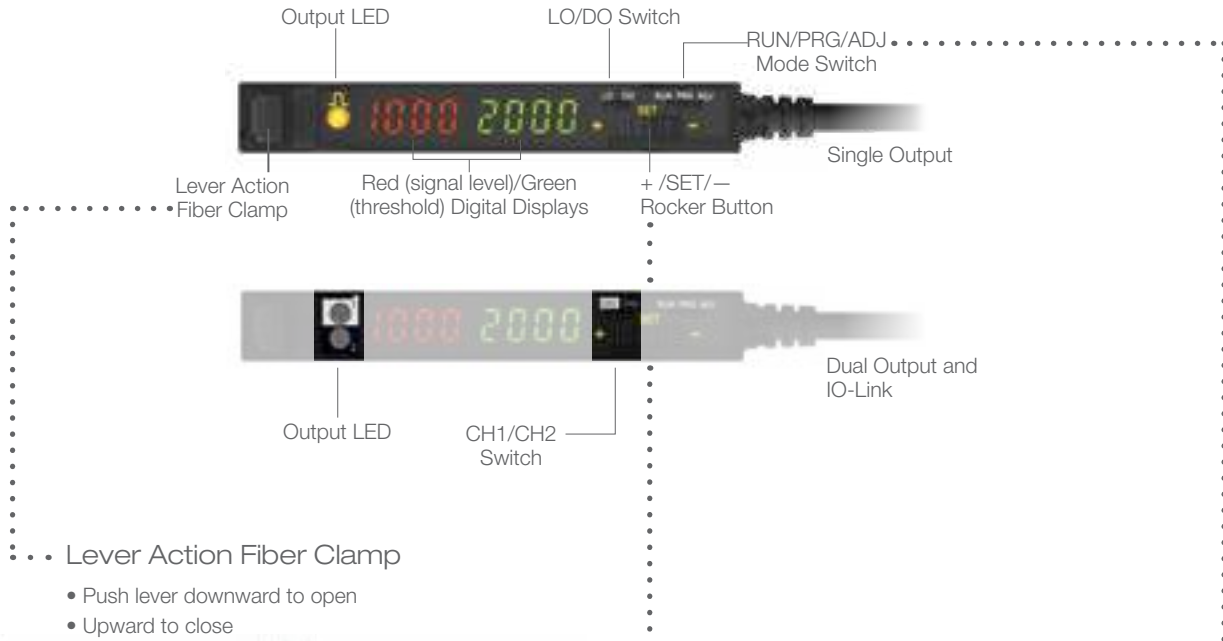
Temperature sensors detect the temperature of an object or an environment in a variety of ways. The vibration and temperature sensor measures RMS velocity, in inches per second or millimeters per second, and temperature.

Series	Sensing Ability	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 M18T	Senses temperature differences as small as 3 °C	12 to 30 V dc	ø 18 (D varies by model)	 <ul style="list-style-type: none"> <li>• Non-contact surface temperature</li> </ul>	
 M12FTH M12FT	Humidity: 0.1% Temperature: 0.1 °C	12 to 24 V dc 3.6 to 5.5 V dc	ø 12 (D varies by model)	 <ul style="list-style-type: none"> <li>• Environment temperature</li> <li>• Compatible with Banner Wireless</li> </ul>	
 QM42VT	Accuracy ± 10% @ 25 °C	3.6 to 5.5 V dc	42 x 13 x 42	 <ul style="list-style-type: none"> <li>• Vibration</li> <li>• Contact surface temperature</li> <li>• Compatible with Banner Wireless</li> </ul>	



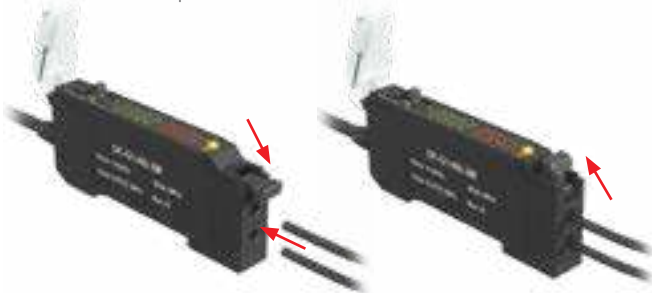
# Selection Guide | Fiber Optic Amplifiers

Simple user interface. Highly visible dual display. Easy sensor set up.



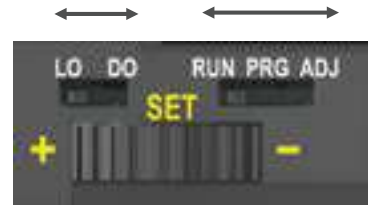
### Lever Action Fiber Clamp

- Push lever downward to open
- Upward to close



### User Interface

- Light Operate and Dark Operate Slide Switch is easy to see and change the selection
- Run, Program and Adjust Mode Switch
  - RUN locks out changes
  - PROGRAM (PRG) allows for full sensor configuration
  - ADJUST (ADJ) enables threshold adjust and teaching



















### Rocker Button





- Three position Jog Switch
  - Rocker Switch (+) and (-) precisely adjusts thresholds and easily navigate menus
  - Press to initiate Teach and SETs, and allow selection of displayed menu

+/SET/-  
Rocker Button



Series	Output Response Time	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 DF-G3	500 $\mu$ s (varies by model)	NPN/PNP models: 10 to 30 V dc IO-Link models: 18 to 30 V dc	33.0 x 72.0 x 10.0	Discrete and Analog IO-Link®    	
 DF-G2	10 $\mu$ s (varies by model)	NPN/PNP models: 10 to 30 V dc IO-Link models: 18 to 30 V dc	33.0 x 72.0 x 10.0	Discrete IO-Link®    	
 DF-G1	High Speed: 200 $\mu$ s Long Range: 2 ms Extra Long Range: 5 ms	NPN/PNP models: 10 to 30 V dc IO-Link models: 18 to 30 V dc	33.0 x 72.0 x 10.0	Discrete IO-Link®  	

**KEY**

			
High Power	Water Detection	Fast Response	Light Intensity

## What Are Fiber Optics?

Fiber optics are used to transmit light over long distances. Optical fibers are thin, transparent strands of optical quality glass or plastic that can be as thin as a strand of hair. In photoelectric sensing, these fibers are used to transmit and/or receive light from the LED of a sensor.

### Plastic Fiber Optic Assemblies

Plastic fiber optics usually have a large, monofilament core which comes in a single strand of fiber optic. Advances in LED technology have improved the performance and range of plastic fiber optic sensing systems to the point that they are nearly equivalent to glass fibers. Plastic fibers are a versatile, cost-effective choice for many fiber optic sensing applications.



#### Advantages:

- Less expensive
- Allow less signal attenuation
- More flexible
- Survive well under repeated flexing
- Can be cut to length in the field
- Can be routed into extremely tight areas

### Glass Fiber Optic Assemblies

Most glass fiber optic assemblies are very rugged and perform reliably in extreme temperatures, corrosive environments, or even in a vacuum. Glass fiber optic assemblies can transmit both visible and infrared light, where plastic fiber optics can only transmit visible light. A common problem experienced with glass fibers is breakage of the individual strands resulting from sharp bending or continued flexing, as occurs on reciprocating mechanisms. Banner glass fibers with a T5 connection identifier in their model numbers are compatible with DF-G plastic amplifiers.














#### Advantages:

- Powerful and very rugged
- Can carry infrared light to provide longer range
- Reliable in extreme temperatures and harsh environments










# Selection Guide | Measuring & Detection Arrays

Using an array of closely spaced light beams, measuring light screens are designed for profiling, inspections and process monitoring.

Series	Beam Spacing (mm)	Max. Range (m)	Array Lengths (mm)	Outputs	Special Considerations	Page # or Web
 EZ-ARRAY	5	4	150 to 2400	IO-Link v 1.0 2 Analog, 2 Discrete, RS-485	 IO-Link®	
 2-Stick MINI-ARRAY	9.5 19.1	6.1 17	133 to 1819	2 Discrete, RS-485		
 MINI-ARRAY	9.5 19.1	6.1 17	133 to 1819	16 Discrete, RS-232 2 Analog, 1 Discrete, RS-232 2 Discrete, RS-485, RS-232 1 Reed Relay, 1 Discrete, RS-485, RS-232		
 High Res MINI-ARRAY	2.5	1.8	163 to 1951	2 Discrete, 2 Analog, RS-232/ RS-485		
 LX	9.5 (crosshatch)	2	67 to 599	Bipolar NPN/PNP	Part Detection Array Minimum Object Size: down to 5.6 mm	







## Registration Mark, Color, Luminescence

Registration mark sensors, also known as color contrast sensors, act as a color detector by identifying subtle color contrasts to inspect registration marks, using one, two, or three color LEDs.

Series	Max Sensing Range	Power	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 Q26	30 mm	12 to 30 V dc	14 x25 x 42	Compact luminescence sensor	
 R58	10 mm	10 to 30 V dc	62.1 x 30 x 83.3	Registration mark sensor	
 Q3X	300 mm	10 to 30 V dc	50 x 25 x 50	Long-range red laser contrast sensor	
 QCM50	150 mm	15 to 30 V dc	50 x 25 x 50	Color sensor Glare suppression  IO-Link®	

# Slot Sensors

Slot sensors, sometimes called optical fork sensors because of their “forked” shape, detect objects that pass between the two arms—one with the emitter, the other with the receiver. The fixed slot width provides reliable opposed-mode sensing of objects as small as 0.30 mm.

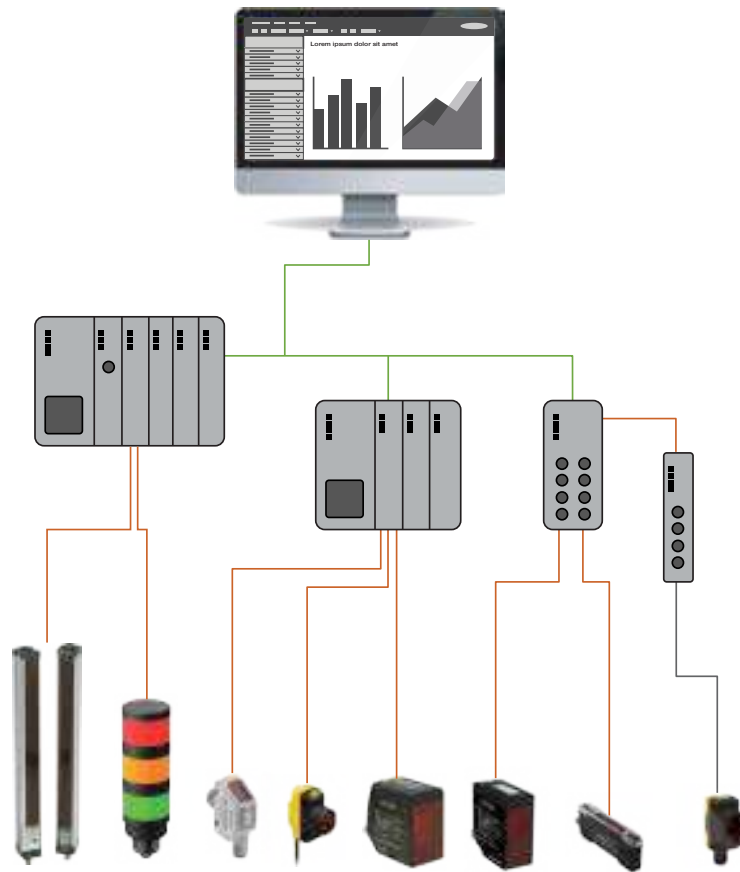
Series	Max Sensing Distance	Response Time	Slot Opening (mm)	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 SLM	220 mm	500 $\mu$ s	10-200 depending on model	Max size: 12 x 252 x 140	Metal Slot Sensor	
 SL10	10 mm	1 ms or 300 $\mu$ s depending on model	10	72 x 52 x 19	10 mm Fixed Slot Sensor	
 SL30	30 mm	1 ms or 300 $\mu$ s depending on model	30	72 x 52 x 19	30 mm Fixed Slot Sensor	

# Radar Sensors

Radar sensors use Frequency Modulated Continuous Wave (FMCW) radar to reliably detect moving or stationary targets, including cars, trains, trucks, and cargo in extreme weather conditions. Radar-based sensors are ideal for collision avoidance on board mobile equipment such as reach stackers, forklifts, and mining vehicles or port machineries such as carriers, handlers, and shippers.

Series	Sensing Mode	Max Sensing Distance	Beam Angle	Dimensions H x W x D (mm)	Output	Configuration	Page # or Web
 Q120R		40 m	24° x 50°	159.5 x 90.8 x 62	Single or Dual Discrete	DIP-switch selectable	
 Q240R		100 m	11° x 13°	186.9 x 159.9 x 55.5	Analog and Discrete or Dual Discrete	DIP-switch selectable	
 QT50R	 	24 m	90° x 76°	100.2 x 74.1 x 46.1	Single or Dual Discrete	DIP-switch selectable	
 Q130R		40 m	90° x 76° or 24° x 50°	130 x 90 x 29	Single Discrete	PC GUI	





## 5 Advantages of IO-Link

### 1. Standardized and Reduced Wiring

IO-Link devices do not require any special or complicated wiring, but can be connected using the same cost-effective standard unshielded 3-wire cables as conventional discrete I/O. In addition, IO-Link eliminates the need for analog sensors and reduces the variety of cordsets required for sensors, which saves inventory costs. IO-Link also supports a master-slave configuration with passive connection points, which further reduces wiring requirements.

### 2. Increased Data Availability

Access to sensor-level data helps ensure the smooth operation of system components, streamlines device replacement, and enables optimized machine maintenance schedules—all of which save costs and reduce the risk of machine downtime. This wealth of valuable data made available through IO-Link is integral for the Industrial Internet of Things (IIoT) and Industry 4.0 initiatives.

### 3. Remote Configuration and Monitoring

With IO-Link, users can read and change device parameters through the control system software, enabling fast configuration and commissioning that saves time and resources. IO-Link allows operators to dynamically change the sensor parameters from the control system as needed—such as in the case of product changeover—which reduces downtime and allows machines to accommodate greater product diversity.

The ability to monitor sensor outputs, receive real-time status alerts, and adjust settings from virtually anywhere allows users to identify and resolve problems that arise on the sensor level in a timely manner. This capability reduces costly downtime and improves overall efficiencies.

### 4. Simple Device Replacement

In addition to the ability to remotely adjust sensor settings, IO-Link's data storage capability also allows for automated parameter reassignment in case of device replacement (also known as Auto-Device Replacement or ADR). The system automatically imports existing sensor parameter values into a replacement sensor for seamless replacement, getting the new device up and running as quickly as possible.






















### 5. Extended Diagnostics

IO-Link provides users with visibility into errors and health status from each device. This means that users can see not only what the sensor is doing but also how well it is performing—a valuable insight into a machine's efficiency. Extended diagnostics allow users to easily identify when a sensor is malfunctioning and diagnose the problem without shutting down the line or machine.

The combination of real-time and historic data not only reduces troubleshooting efforts as issues arise but also allows for optimization of machine maintenance schedules, saving costs and increasing efficiency in the long term.



IO-Link (IEC61131-9) is an open standard serial communication protocol that allows for the bi-directional exchange of data from sensors and devices that support IO-Link and are connected to a master. The IO-Link master can transmit this data over various networks, fieldbuses, or backplane buses, making the data accessible for immediate action or long-term analysis via an industrial information system (PLC, HMI, etc.). Each IO-Link sensor has an IODD (IO Device Description) file that describes the device and its IO-Link capabilities.

Series	Sensing Range	Repeatability (mm)	Accuracy (mm)	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 LM	50 to 150 mm	±0.002	±0.2	48.5 x 23.5 x 35.8	  <b>MPD</b>	26
 Q4X100 Q4X300 Q4X600	25 to 100 mm 25 to 300 mm 25 to 600 mm	±0.2 ±0.5 to 3.0 ±0.5 to 3.0	±0.25 to 1.0 ±0.8 to 9.0 ±0.8 to 25.0	57.4 x 18 x 43.6	  	28
 Q4XF110 Q4XF310 Q4XF610	35 to 110 mm 35 to 310 mm 35 to 610 mm	±0.2 ±0.5 to 3.0 ±0.5 to 3.0	±0.25 to 1.0 ±0.8 to 9.0 ±0.8 to 25.0	57.4 x 18 x 43.6	  	28
 LE250 LE550	100 to 400 mm 100 mm to 1 m	±0.01 to 0.1 ±0.125 to 6.0	±0.375 to 1.0 ±2.0 to 10.0	60 x 26 x 56		30
 Q5X	9.5 cm to 2 m	±0.5 to 10.0	±3.0 to 35.0	60 x 25 x 52	  <b>MPD</b>	24
 LTF12 LTF24	50 mm to 12 m 50 mm to 24 m	±0.45 to 4.5 ±0.45 to 6.0	±10.0 ±25.0	77 x 26 x 56		32
 QS18	Diffuse: 900 mm Polar Retro: 3.5 m Convergent: 43 mm Clear Object: 3 m			35 x 15 x 31 (varies by model)	 <b>MPD</b>	34
 Q20	30 to 200 mm			35 x 15 x 31		36
 QCM50	Anti-Glare: 18 to 32 mm Small Spot: 18 to 60 mm Long Range: 20 to 150 mm			50 x 25 x 50	 	

**KEY**

			<b>MPD</b> Modular Process Data		
Percent Match	Internal Temp Monitoring	Laser Disable		Washdown	Clear Object



## T18-2

### Washdown Sensors for Harsh Environments

- IP69K epoxy encapsulated for maximum reliability in wet thermal shock environments
- ECOLAB™ certified FDA grade plastic housing
- Ultrasonically welded joints for superior sealing and durability
- Improved hygienic design for easier cleaning
- Available with integral M12 quick disconnect and 2 or 9 meter cable

#### Emitter/Receiver

Type	Range	Output	Model*
Emitter	25 m (82 ft)	None	<b>T18-2NAEL-Q8</b>
	25 m (82 ft) with beam inhibit		<b>T18-2NAEJ-Q8</b>
	25 m (82 ft) with LED adjustment potentiometer		<b>T18-2NAES-Q8</b>
Receiver	25 m (82 ft)	Complementary NPN	<b>T18-2VNRL-Q8</b>
	25 m (82 ft)	Complementary PNP	<b>T18-2VPRL-Q8</b>
	25 m (82 ft) with gain adjustment potentiometer	Complementary NPN	<b>T18-2VNRS-Q8</b>
		Complementary PNP	<b>T18-2VPRS-Q8</b>

#### Polarized Retroreflective

Range	Output	Model*
6 m (19.7 ft) with BRT-84 reflector	Complementary NPN	<b>T18-2VNLP-Q8</b>
	Complementary PNP	<b>T18-2VPLP-Q8</b>
6 m (19.7 ft) with BRT-84 reflector, with gain adjustment potentiometer	Complementary NPN	<b>T18-2VNLPC-Q8</b>
	Complementary PNP	<b>T18-2VPLPC-Q8</b>

\* Integral 4-pin M12/Euro-style quick disconnect models are listed.

- To order the 2 m (6 ft) cable model, replace the suffix "-Q8" with "-2M"
- To order the 9 m (30 ft) cable model, replace the suffix "-Q8" with "-9M"

## Next Generation of Washdown Sensors



### Diffuse

Range	Output	Model*
750 mm (29.5 in) with adjustment	Complementary NPN	<b>T18-2VNDL-Q8</b>
	Complementary PNP	<b>T18-2VPDL-Q8</b>
300 mm (11.8 in) with gain adjustment potentiometer	Complementary NPN	<b>T18-2VNDS-Q8</b>
	Complementary PNP	<b>T18-2VPDS-Q8</b>

### Fixed Field

Range	Output	Visible Red Emitter Models*	Infrared Emitter Models*
30 mm	Complementary NPN	<b>T18-2VNFF30-Q8</b>	<b>T18-2VNFF30IR-Q8</b>
	Complementary PNP	<b>T18-2VPFF30-Q8</b>	<b>T18-2VPFF30IR-Q8</b>
50 mm	Complementary NPN	<b>T18-2VNFF50-Q8</b>	<b>T18-2VNFF50IR-Q8</b>
	Complementary PNP	<b>T18-2VPFF50-Q8</b>	<b>T18-2VPFF50IR-Q8</b>
75 mm	Complementary NPN	<b>T18-2VNFF75-Q8</b>	<b>T18-2VNFF75IR-Q8</b>
	Complementary PNP	<b>T18-2VPFF75-Q8</b>	<b>T18-2VPFF75IR-Q8</b>
100 mm	Complementary NPN	<b>T18-2VNFF100-Q8</b>	<b>T18-2VNFF100IR-Q8</b>
	Complementary PNP	<b>T18-2VPFF100-Q8</b>	<b>T18-2VPFF100IR-Q8</b>
150 mm	Complementary NPN	<b>T18-2VNFF150-Q8</b>	<b>T18-2VNFF150IR-Q8</b>
	Complementary PNP	<b>T18-2VPFF150-Q8</b>	<b>T18-2VPFF150IR-Q8</b>
200 mm	Complementary NPN	<b>T18-2VNFF200-Q8</b>	<b>T18-2VNFF200IR-Q8</b>
	Complementary PNP	<b>T18-2VPFF200-Q8</b>	<b>T18-2VPFF200IR-Q8</b>

\* Integral 4-pin M12/Euro-style quick disconnect models are listed.

- To order the 2 m (6 ft) cable model, replace the suffix "-Q8" with "-2M"
- To order the 9 m (30 ft) cable model, replace the suffix "-Q8" with "-9M"



## VS8 Miniature Sensors

- Installs in the smallest of spaces
- Red laser models provide bright, precise laser light spot for optimum small part detection
- High switching frequency for detection in even the fastest processes
- User-friendly operation using electronic push button or remote input provides reliable and precise detection
- Red laser, Red LED, and Blue LED versions to solve challenging applications
- ECOLAB and IP67

### Opposed Mode

Sensing Mode	Range	Output	Connection	Model
Red Laser Emitter with Beam Inhibit	0 to 3 m (0 in to 9.8 ft)	—	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8LEJ
Red Laser Emitter with Beam Inhibit	0 to 3 m (0 in to 9.8 ft)	—	200 mm (7.8 in) PUR cable with a 4-pin M8/Pico-style male quick disconnect (QD)	VS8LEJQ
Receiver	0 to 3 m (0 in to 9.8 ft)	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8EAPR VS8EANR
Receiver	0 to 3 m (0 in to 9.8 ft)	PNP NPN	200 mm (7.8 in) PUR cable with a 4-pin M8/Pico-style male quick disconnect (QD)	VS8EAPRQ VS8EANRQ

### Retroreflective Mode

Sensing Mode	Range	Output	Connection	Model
Red LED Retro Reflective	0.1 m to 1.6 m (3.9 in to 62.9 in) with BRT-2X2	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8EAPLP VS8EANLP
Red LED Retro Reflective	0.1 m to 1.6 m (3.9 in to 62.9 in) with BRT-2X2	PNP NPN	200 mm (7.8 in) PUR cable with a 4-pin M8/Pico-style male quick disconnect (QD)	VS8EAPLPQ VS8EANLPQ
Red Laser Retro Reflective	0.1 m to 2 m (3.9 in to 78.7 in) with BRT-51X51BM	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8EAPLLP VS8EANLLP
Red Laser Retro Reflective	0.1 m to 2 m (3.9 in to 78.7 in) with BRT-51X51BM	PNP NPN	200 mm (7.8 in) PUR cable with a 4-pin M8/Pico-style male quick disconnect (QD)	VS8EAPLLPQ VS8EANLLPQ

## Miniature Size

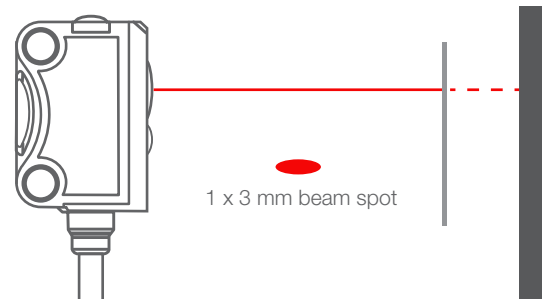


## Industry Standard Mounting

- 15 mm spacing on mounting holes
- Dovetail mounting option allows  $\pm 10^\circ$  tip/pivot adjustments of the sensor even when installed in tight spaces

## Ultra Small Beam Spot

- Can reliably detect an object with a diameter of 0.5 mm at a distance of 70 mm (laser adjustable-field and fixed background suppression models)



## Background Suppression

Sensing Mode	Range	Output	Connection	Model
Red LED, Adjustable Background Suppression	5 to 70 mm (0.20 to 2.75 in)	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8EAPAF70* VS8EANAF70*
Red Laser, Adjustable Background Suppression	6 to 70 mm (0.24 to 2.75 in)	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8EAPLAF70* VS8EANLAF70*
Blue LED, Fixed 30 mm Background Suppression	2 to 30 mm (0.08 to 1.18 in)	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8APFF30B** VS8ANFF30B**
Red LED, Fixed 15 mm Background Suppression	2 to 15 mm (0.08 to 0.59 in)	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8APFF15** VS8ANFF15**
Red LED, Fixed 30 mm Background Suppression	2 mm to 30 mm (0.08 to 1.18 in)	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8APFF30** VS8ANFF30**
Red LED, Fixed 50 mm Background Suppression	2 mm to 50 mm (0.08 to 1.97 in)	PNP NPN	2 m (6.5 ft) unterminated 4-wire PUR cable	VS8APFF50** VS8ANFF50**

\* To order the 200 mm (7.8 in) PUR cable model with a 4-pin M8/Pico-style quick disconnect, add suffix "Q" to the model number. For example, VS8EAPAF70Q. Only available for AF and LAF models.

To order the 200 mm (7.8 in) PUR cable model with a 4-pin M12/Euro-style quick disconnect, add suffix "Q5" to the model number. For example, VS8EAPAF70Q5. Only available for AF and LAF models.

\*\* To order the 200 mm (7.8 in) PUR cable model with a 3-pin M8/Pico-style quick disconnect, add suffix "Q3" to the model number. For example, VS8APFF15Q3. Only available for FF models.





- 4-digit display and 3 button interface for easy set-up and adjustment
- Distance to target viewable as centimeters (default) or inches



**IO-Link®**

Program with push button, remote teach, IO-Link, or optional Remote Sensor Display (RSD1QP). Cordset MQDC-4501SS required to use RSD.



Rated IP67 for reliable performance in wet environments



Protective bracket for use in harsh environments



Class 2 laser with small, highly visible spot for easy alignment and small object detection



270-degree rotatable M12 QD for simple mounting

## Reliably Detects Challenging Targets



Round



Uneven



Shiny or metal



Dark surface



Multicolored



Clear

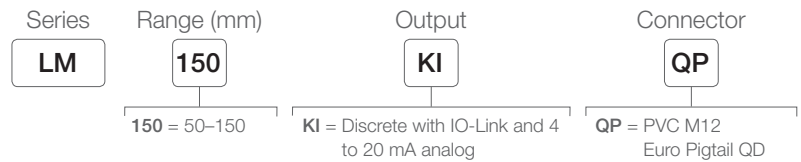
Dynamically adjusted laser power increases output for dark targets or objects at steep or uneven angles, while reducing power for shiny targets, providing accurate measurements across a wide range of challenging targets. A small beam spot minimizes measurement variation across color transitions.

## LM Series

### Compact Precision Laser Measurement Sensor

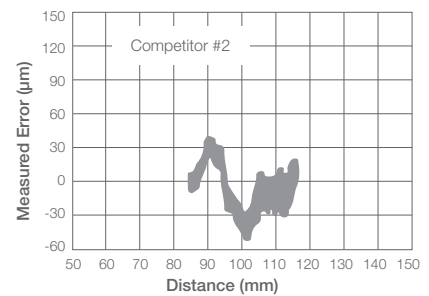
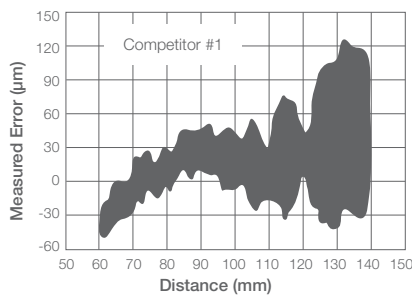
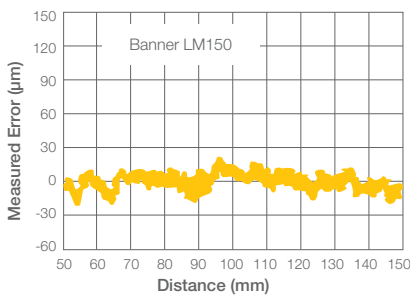


- Superior precision for real world applications
- Best in class thermal & mechanical stability
- Small housing design for the tightest spaces
- High response speed for fast moving targets
- Simplified set up, control and replacement with optional Remote Sensor Display(RSD)



### Linearity

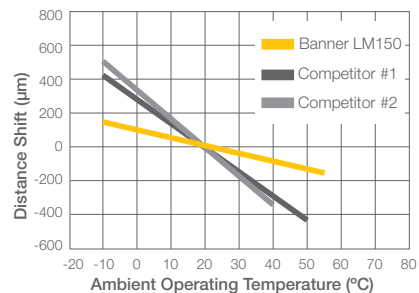
Linearity is the maximum deviation between an ideal straight line measurement and the actual measurement. The more linear a sensor is the more consistent and precise the sensing results.



Example linearity on 90% white card

### Temperature Effect

A sensor with minimal temperature effect is critical for precise sensing applications since the induced error from just a few degrees of temperature shift can greatly impact sensors results.

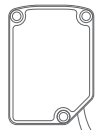
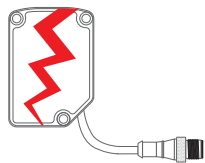


Example temperature effect at max range

# RSD

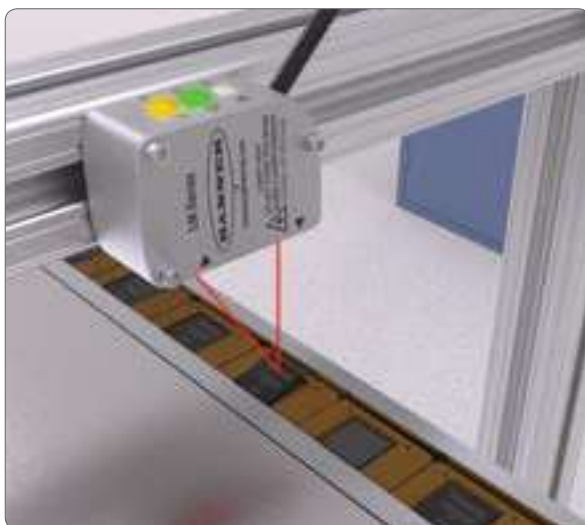
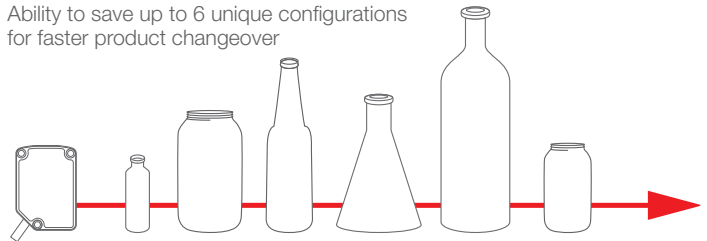
## Remote Sensor Display

- Can be used for initial setup by equipment manufacturers with the ability to copy settings across many sensors.
- Allows for configuration of remote sensor
- Easy to set up and use with a 2-line, 8-character display
- Display live distance measurement for remote monitoring
- Ability to save up to 6 unique configurations
- Not required for continuous operation of configured sensor(s)



Simple device replacement with saved configurations

Ability to save up to 6 unique configurations for faster product changeover



### Correct Orientation/Alignment

#### Challenge

IC chips can be slightly tilted in the nests – which creates a small distance change that is difficult to detect. They can also be seated in the nests, but placed upside down. Test stations have space limitations and do not have room for large vision systems or sensors.

#### Key Features

Resolution on the LM is able to detect 0.004 mm of height variation, even on black targets. The LM's Dual Teach mode, which measures distance and intensity, makes it able to distinguish contrast differences.

#### Key Benefits

The LM's precision allows it to catch if the chips are not seated completely in the nest, while the Dual Teach Mode can verify that the chip is right side up, providing a more reliable inspection and limiting false failures. The compact size of the LM is easy to integrate into the test fixture.



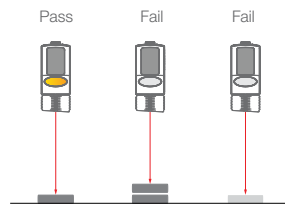
 IO-Link®

## Q4X Series

Versatile, Rugged, Laser Measurement Sensor

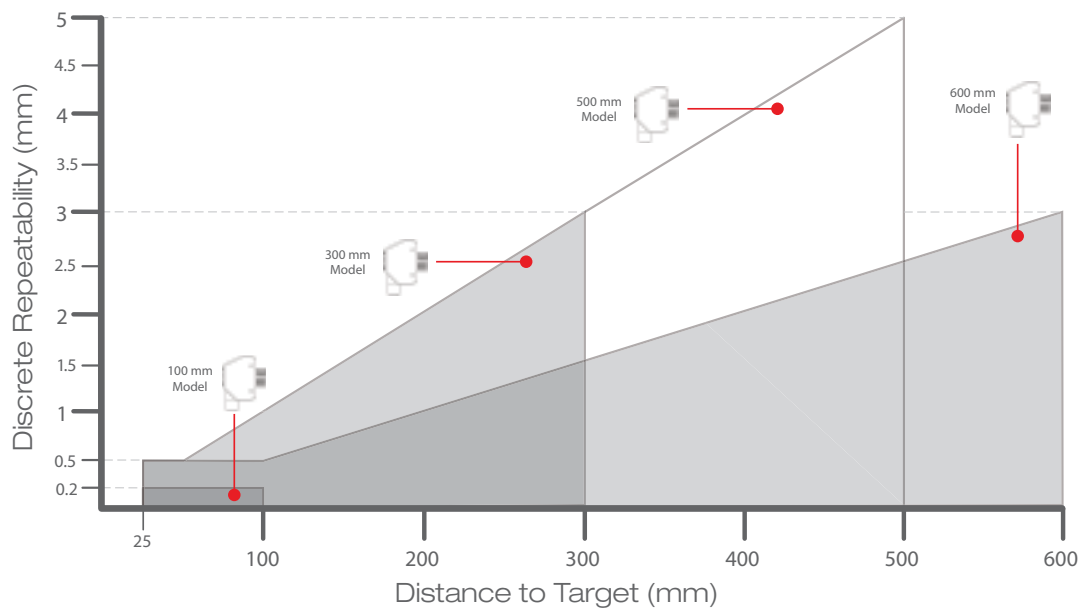
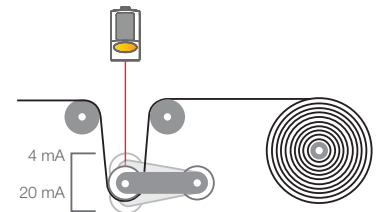
- Save time and money with the Q4X which is ready to measure right out of the box
- Four-digit display shows distance to target in mm
- FDA-grade stainless steel is suitable for IP69K washdown environments
- A simple user experience from installation to setup
  - Bright spot alignment
  - Three push buttons simplify setup
  - Intuitive menus

### Error-Proofing



Distance	✓	✗	✓
Color	✓	✓	✗

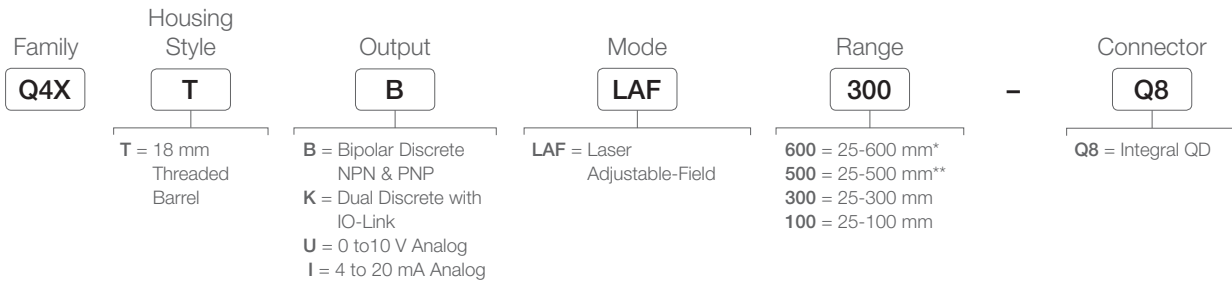
### Measurement





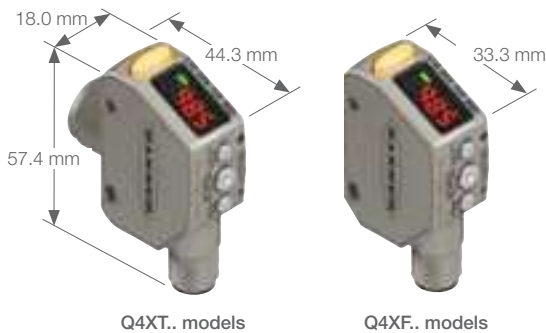
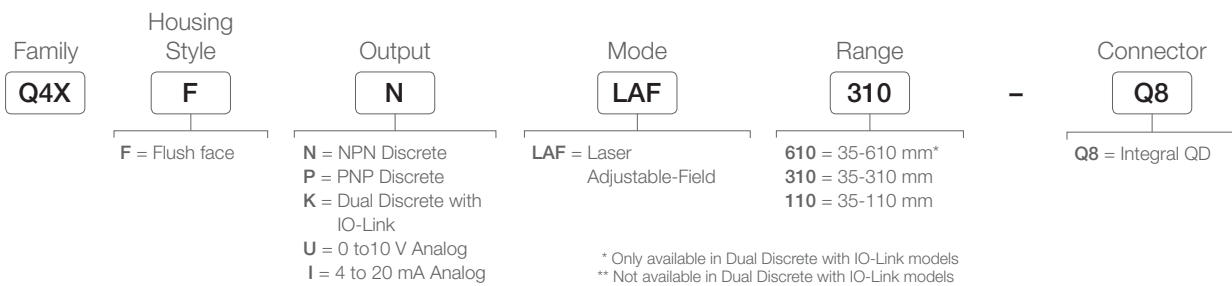
### Threaded-Barrel Q4XT

Example Model Number: Q4XTBLAF300-Q8



### Flush-Mount Q4XF

Example Model Number: Q4XFNLAF310-Q8







**IO-Link®**

## LE Series Laser Measurement Sensors

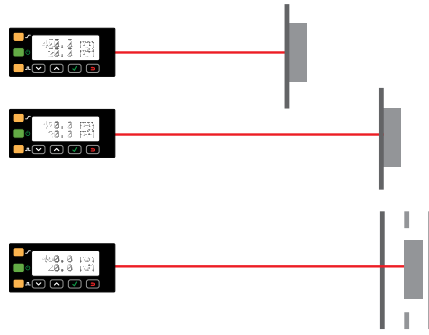
- Ready to measure right out of the box
- Easy adjustment with a two-line, eight-character intuitive display
- Repeatability and accuracy for challenging targets, from metal to black rubber
- Visible laser for small spot size and simple alignment

### Intuitive Display, Simple Adjustment

#### Setting Options:

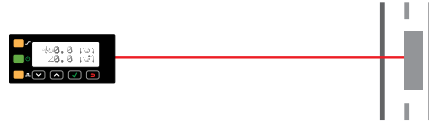
##### 2-Point Teach

Teach two targets as the end points of the analog span or discrete output window



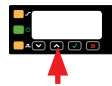
##### Mid-Point Teach

Teach a window of user-defined size around a target



##### Push Button Adjust

Manually set analog and discrete output end points without presenting a target



### Precision Laser Measurement

#### LE250

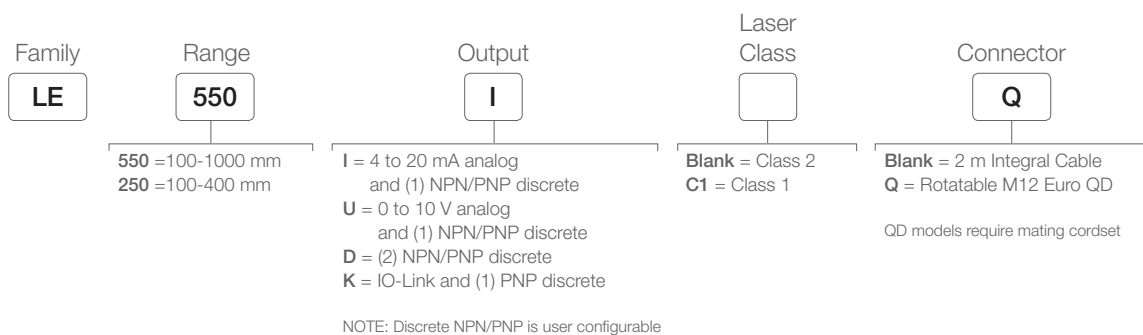
- Measurement Range up to 400 millimeters
- Resolution as fine as 0.02 millimeters
- Small laser spot for detecting small features and best performance across changing colors and reflectivity



#### LE550

- Measurement Range up to 1 meter
- Sub millimeter resolution across entire range
- Larger spot for better measurement stability across uneven surfaces



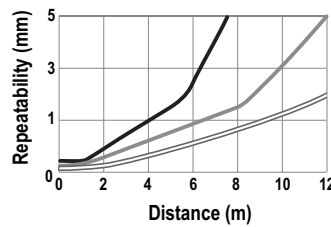


## LTF Series Laser Measurement Sensor

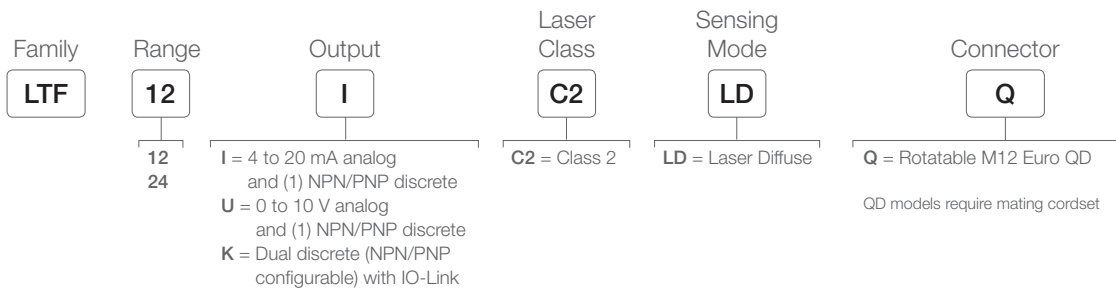
- A powerful long-range distance measuring sensor with advanced functions including:
  - Remote teach
  - High excess gain for seeing really dark targets
  - Laser power control for accurately measuring shiny targets
  - Laser inhibit
  - Cross-talk avoidance
  - Fast response speed
  - Delay timers
- Sensing range of 50 mm to 24 m
- Durable housing rated IP67
- Superior resistance to ambient light sources



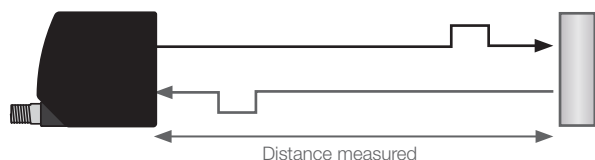
### Best-in-Class Combination of Repeatability and Range



The LTF detects dark targets at 11 meters and white targets at 24 meters with repeatability <5 millimeters



## Time-of-Flight Measurement



The LTF sensor uses time-of-flight measurement, emitting a pulsed light and measuring the amount of time for the light to reflect off the object and return to the sensor to calculate the distance. This enables sensing in long-range applications across a wide variety of targets.

## Long Range Measurement Applications

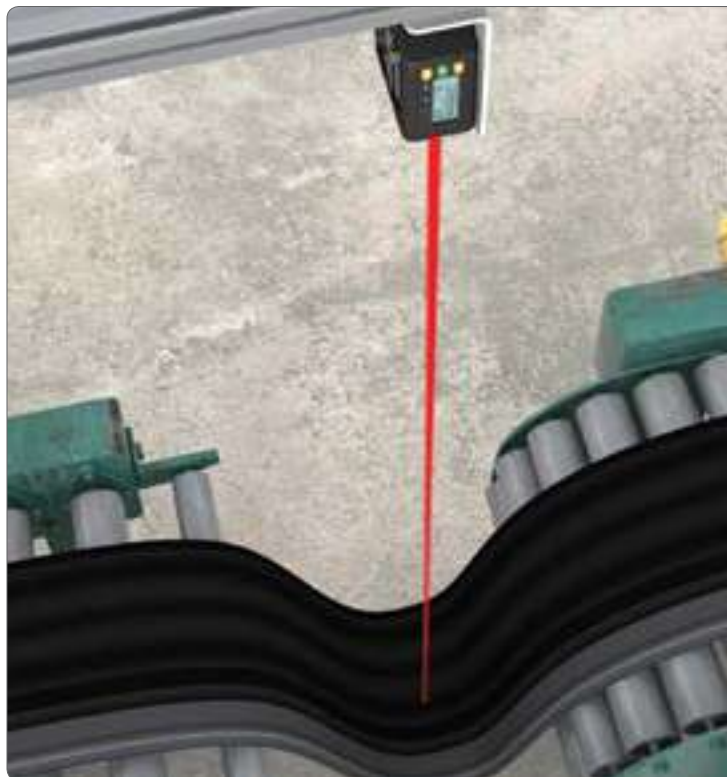
- Roll diameter
- Loop control
- Automated storage
- Presence/absence
- Palletizer
- Transfer press
- Robot end effector
- Fill Level



Monitoring levels inside a high-volume hopper



Detecting black parts on a shiny background



Loop control on a calendering machine

## QS18 Series

### Versatile Sensor for Global Manufacturing Needs



- All-purpose sensors solve the widest variety of sensing applications
- Versatile sensor with many mounting options
- Meets IP67 and NEMA 6 standards for use in harsh environments
- Right-angle barrel- and side-mount sensors
- Bright LEDs visible from 360 degrees



#### QS18 Standard

The QS18 Standard Sensor requires little to no adjustment. The sensor is available in multiple sensing modes and has a wide variety of connection options.



IO-Link®

#### QS18 Expert™

The QS18 Expert™ offers advanced sensing with single push-button programming and several sensing modes and configuration options.



IO-Link®

#### QS18 Clear Object

The QS18 Clear Object sensor is designed for clear object detection in plastic or glass containers.



#### QS18 Laser

The QS18 Laser Sensor has a narrow visible beam spot for easy alignment and small object detection.



#### QS18 Adjustable-Field

The QS18 Adjustable-Field Sensor is ideal for background and foreground suppression. The sensor is available in long-range models for sensing up to 300 mm.



IO-Link®

#### QS18 Electronic Adjustable Field

The newest addition to the popular QS18 Series family is an electronic adjustable field background suppression sensor with barrel mount. Electronic adjustment provides a more robust optical design by eliminating moving parts, such as lenses.



#### QS18 Universal Voltage

The QS18 Universal Voltage Sensor operates on ac or dc voltage and has several sensing modes available, making it an ideal sensor for many manufacturing environments.

# QS30 Series

## High-Performance, Long-Range Sensors

- Right-angle, barrel- and side-mount sensors
- Specialized models for reliable detection of water or liquids containing water
- Specialized photoelectric sensors that have the ability to differentiate colors in low contrast applications



**QS30 Standard**

Eight sensing modes for solving most applications: opposed, retroreflective, convergent, diffuse, plastic and glass fiber optic, and adjustable-field and fixed-field. High-performance sensing with visible, long-range Class 1 and 2 lasers with narrow effective beam for small object detection and precise position control.



**QS30 Expert™**

Single push-button programming with five advanced sensing options for reliable detection of reflective objects and resolves slight contrast differences.



**QS30 Water Detection**

The QS30 Water Sensors have an infrared wavelength that is tuned to the absorption band of water.



**QS30 Adjustable-Field**

Background suppression models for detection of objects when the background condition is not fixed, and foreground suppression models for detection when background is fixed and object varies in color or shape.



**QS30 Universal Voltage**

Compact ac or dc powered sensor can be used in almost any mounting configuration, including 30 mm barrel, base or side mounting.



## Q12 Series

### Miniature Self-Contained Sensors

- Sets a new industry standard for ultra-miniature photoelectric sensors delivering powerful sensing performance in extremely confined areas
- Features a housing just 22 by 8 by 12 mm, with bipolar NPN/PNP outputs; Rated IP67 for use in the widest range of locations and applications
- Available in opposed, fixed-field, and polarized and non-polarized retroreflective sensing modes; dark- or light-operate models
- Available in models with rugged, sealed housing or PFA chemical-resistant jacket
- Mounts directly on or inside manufacturing equipment, with robust metal-lined mounting holes
- Uses unique overmolded design for enhanced durability and shielding

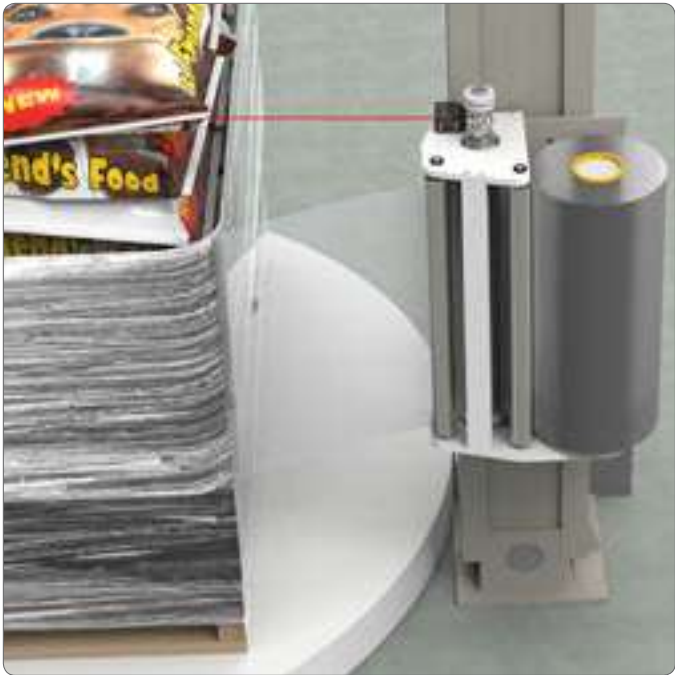


## Q20 Series

### Industry Standard Global Housing

- Available in opposed, polarized and non-polarized retroreflective, diffuse, and electronic adjustable field models
- Offers visible red beam for easy alignment on most models
- Features bright LED status indicators visible from 360°
- Provides water-tight, IP67 and NEMA 6 rated enclosure for rugged, reliable sensing
- Offers 10 to 30V dc supply voltage with complementary NPN or PNP outputs, depending on model
- Provides versatile mounting options, including M3 (3 mm) threaded inserts with 25.4 mm hole spacing
- Includes single-turn gain potentiometer for easy configuration, depending on model





Dog food pallet detection using Q5X



Wafer detection using the VS8



Auto seat adjustment measurement using the LE550



Detection in a washdown environment using a T18-2









# Machine Safety

Designed to be easy to use and implement, developed to protect personnel and equipment from accident and injury, and built to perform reliably in challenging environments, our comprehensive collection of machine safety products provide the highest levels of safety without compromising productivity.

# Selection Guide | Safety Light Curtains

Safety light curtains protect personnel from injury and machines from damage by creating a sensing screen that guards machine access points and perimeters. Banner offers intuitive, easy-to-use safety light curtains for a wide variety of safety applications.

Type 4 safety light curtains protect personnel from injury and machines from damage by guarding points of operation, access, areas and perimeters. Type 2 safety light curtains are a cost-effective light curtain safety solution for guarding lower-risk applications, where the result of an accident is only a slight injury.














Series		Max Sensing Range (m)	Defined Area (mm)	Dimensions H x W x D (mm)	Safety Rating	Special Considerations	Page # or Web
HEAVY DUTY	EZ-SCREEN® LS	12	280 to 1820	H (varies by model) 36 x 45	Type 4 Category 4/PLe SIL3; SIL CL3		46
	EZ-SCREEN® LS Basic	8	350 to 1820	H (varies by model) 36 x 45	Type 4 Category 4/PLe SIL3; SIL CL3		47
	EZ-SCREEN®	18	150 to 2400	H (varies by model) 36 x 45	Type 4 Category 4/PLe SIL3; SIL CL3		
	SGS Grids	60	up to 1200	H (varies by model) 52 x 57	Type 4 Category 4/PLe SIL3; SIL CL3	 Active/Passive	51
COMPACT	EZ-SCREEN® LP	7	270 to 1250	H (varies by model) 28 x 26	Type 4 Category 4/PLe SIL3; SIL CL3		48
	EZ-SCREEN® LP Basic	4	270 to 690	H (varies by model) 28 x 26	Type 4 Category 4/PLe SIL3; SIL CL3		49
	SLC4	2	160 to 320	H (varies by model) 27 x 22	Type 4 Category 4/PLe SIL3; SIL CL3		50
	EZ-SCREEN® Type 2	15	150 to 1800	H (varies by model) 25 x 32 mm	Type 2 Category 2/PLc		

**KEY**

- Finger Detection
- Hand Detection
- Ankle Detection
- Body Detection
- Muting Option
- Cascadable
- Indicator Capable






# Emergency Stop

Emergency stop devices provide workers a means of stopping a device during an emergency by pushing a button or pulling a rope in order to prevent injury to personnel and material loss.






Series	Mounting	Environmental Rating	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
 30 mm Mount E-Stop Button	30 mm	IP65 IP69 available	120 x ø 80	 	53
 Flush Mount E-Stop Button	Flush Mount	IP65	H (varies by model) x 81 x 80	  	53
 Panel Mount E-Stop Button	Panel Mount	IP65	ø 40, ø 44, and ø 60 mm	 	
 Rope Pull	Flush Mount	IP67	Dimensions vary by model	Metal or plastic Up to 75 m rope length	

# Safety Laser Scanners

Safety laser scanners provide a solution for safeguarding mobile vehicles and stationary applications, such as the interior of robotic work cells that cannot be solved by other safeguarding solutions.

Series	Range		Scanning Angle	Dimensions H x W x D (mm)	Special Considerations	Page # or Web
	Protective Field	Warning Field				
 SX5	up to 5.5 m	40 m	275°	152 x 112 x 102	 	52
 AG4	up to 6.2 m	15 m	190°	130 x 148 x 135		

**KEY**

				
Illuminated	Lockable	Cascadable	LCD Display	Muting

# Selection Guide | Safety Relays and Controllers

Industrial safety controllers and relays provide an interface between safety devices and the machines and processes those devices monitor for a complete and easy-to-use safety control solution.



Safety Relays

Cost effective for simple safety circuits

- Pre-set Functionality: Configuration not required
- Safety Inputs: 1
- Independently controlled Safety Outputs: 1, 4 to 7A



Hybrid Safety Controller plus 2 Safety Relays

Flexible and cost effective solution for machines typically using 2 Safety Relays

- PC Configurable: Flexible and easy-to-use
- Safety Inputs: up to 10
- Independently controlled Safety Outputs: 2, 6A each
- Convertible Safety Inputs: 4
- Terminal LEDs for easy troubleshooting
- Industrial Ethernet

EtherNet/IP Modbus PCCC



Expandable Safety Controller

Expandable for Complex Safety applications where 3 or more safety relays are typically use

- PC Configurable: Flexible and easy-to-use
- Safety Inputs: 26 (base unit) up to 154
- Independently controlled Safety Outputs: up to 68, 0.5A to 6A each
- Convertible Safety Inputs: 8 (Base Unit) up to 40
- LCD Display for easy troubleshooting
- Industrial Ethernet












EtherNet/IP Modbus PCCC

## SC10 and SC/XS26 PC Configuration Software

The feature-rich SC10 and SC/XS26 safety controller software provides a seamless user interface for setting up and managing safety systems. The software features an intuitive icon-based, drag-and-drop user interface to reduce the learning curve and speed up commissioning.

- Complex configurations made easy
- Simulate configurations before implementation
- Auto configure industrial ethernet for remote monitoring and diagnostics



	Series	# of Safe Inputs	Independently Controlled Safe Outputs	Max. Safety Output Rating	E-Stop	Rope Pull	Light Curtain/Scanner	Light Curtain/Scanner with EDM	Gate Switch (Complimentary Outputs ie. NC/NO)	Gate Switch (Similar Outputs ie. NC/NC)	Safety Mat	Two-Hand Control	Muting	ON/OFF Delay
CONFIGURABLE SAFETY CONTROLLERS	 XS26	up to 154*	up to 68*	0.5A, 6A* ea.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	 SC26	up to 26	2	0.5A ea.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	 SC10	up to 10	2	6A ea.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PRE-CONFIGURED SAFETY RELAY MODULES	 SR	1	1	6A				✓						
	 IM	1	1	6A				✓						
	 ES	1	1	7A	✓	✓				✓				
	 UM	1	1	7A	✓	✓	✓	✓	✓	✓				
	 GM	1	1	6A					✓					
	 SM	1	1	6A							✓			
	 AT Two-Hand	2 STB	1	6A								✓		
	 MMD	2	1	6A	✓	✓	✓	✓		✓			✓	

\* Expandable input and output modules available

# Selection Guide | Safety Switches

Safety switches respond when a mechanical guard is opened. They feature “positive opening” contacts for high reliability regardless of environmental conditions and withstand attempts to override the switch and defeat the system.



## Non-Contact Switches

- Two piece design where sensor and actuator do not contact
- In-Series Diagnostics (ISD) provides users with data from each sensor in a cascade chain
- Cascade up to 32 sensors while achieving the highest level of safety
- Accommodating to misalignment
- IP69 solutions available
- Available with the highest level of tamper resistance



## Hinge Switches

- One piece sensor and actuator with hinge function
- Fast installation and set-up with repositionable safety switch point
- Stainless steel and IP69 available
- Matching hinges without sensing available for additional door support
- Available with up to 270° safety switch point operation range



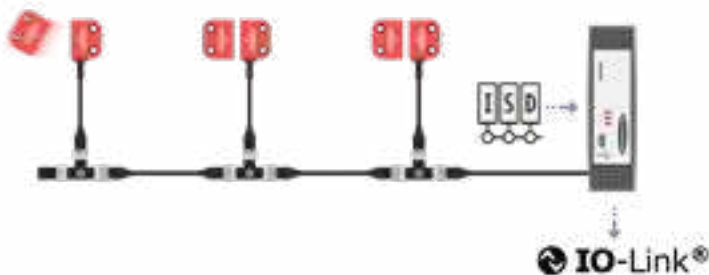
## Mechanical Switches

- Two piece design with mechanical operator feedback
- Flexible actuator options for misalignment
- Rotatable heads for flexible installation
- Mechanically coded actuator to minimize tampering
- Up to 15N latching force
































## Locking Switches

- Two piece design with up to 2000N holding force
- Flexible actuator options for misalignment
- Rotatable heads for flexible installation
- Mechanically coded actuator to minimize tampering
- Up to 15N latching force



In-Series Diagnostics (ISD) provides users with status and performance data from each sensor in a cascade chain. The ISD data collected is converted to IO-Link so it can be accessed with an HMI or similar device. Users receive notification when an event has occurred as well as where in the series the event occurred. Events include the opening or closing of a door, door misalignment, wrong actuator taught, and a number of switch health attributes.

Series	Switch Technology	Environmental Rating	Tamper Resistance- Coding Level	Safety Rating (single sensor)	Assured On Sao/ Misalignment Tolerance (mm)	# of Cascaded Sensors at Ple/Cat4	Non-Contact	Position Monitoring	LED Status Indication	ISD (In-Series Diagnostics)	Locking (1K to 2K N Holding Force)	Latching (~10N Force)
	SI-MAG	Mag	IP65	Low	Ple/Cat 4	3-5						
	SI-RF Non- Cascade	RFID	IP69	Low High Unique	Ple/Cat 4	10						
	SI-RF Cascade	RFID	IP69	Low High Unique	Ple/Cat 4	10	32					
	SI-RF Cascade and ISD	RFID	IP69	Low High Unique	Ple/Cat 4	10	32					
	SI-HG63	Mech	IP67 & IP69 Stainless Steel	Low	up to Ple/ Cat 4*							
	SI-HG80	Mech	IP65	Low	Ple/Cat 3**							
	SI-LS31	Mech	IP65	Low	Ple/Cat 3**							
	SI- LS100/83	Mech	IP65	Low	Ple/Cat 3**							
	SI- QS90/75	Mech	IP65	Low	Ple/Cat 3**							
	SI-LM40	Mech	IP65 Metal	Low	Ple/Cat 3**							
	SI-LS42	Mech & Solenoid Locking	IP65	Low	Ple/Cat 3**							
	SI-QM100	Mech & Solenoid Locking	IP65 Metal	Low	Ple/Cat 3**							

\* Dual Switch Hinge model or applicable second safety switch added for Ple/Cat 4

\*\* Ple/Cat 4 achieved with applicable second safety switch added



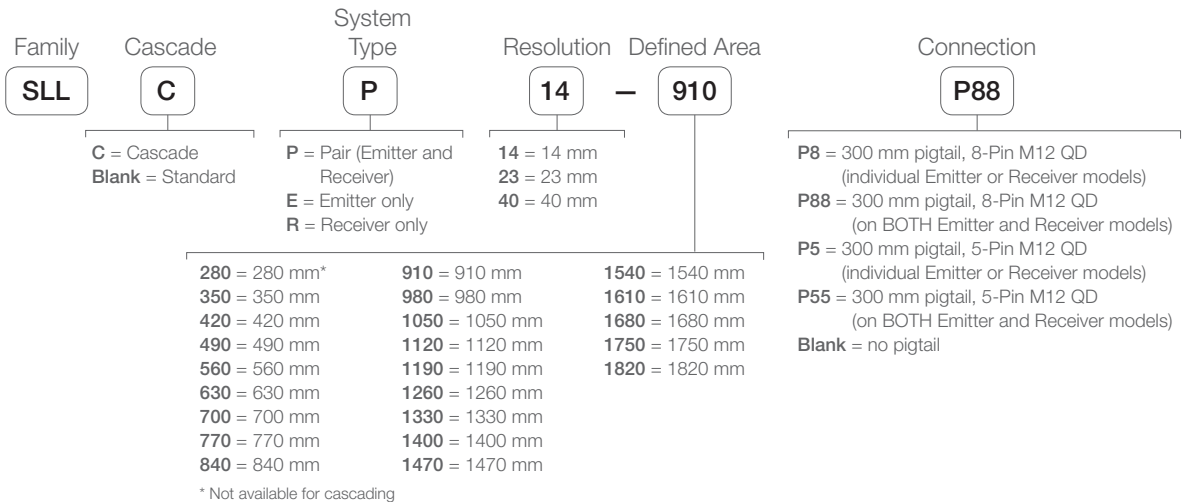


## LS Series

### Full Feature Heavy-Duty Type 4 Safety Light Curtain

EZ-SCREEN® LS light curtains are easy-to-use safety devices with an advanced feature set for a wide range of applications. They are built to withstand challenges commonly found in manufacturing and packaging environments.

- Full featured models with options to meet a wide range of applications
- Heavy-duty aluminum housing and recessed window to avoid damage in harsh environments
- End-to-end sensing (no blind zone)
- Highly visible alignment and diagnostic indicators
- 14, 23 & 40 mm resolution (detection capability)
- Available in 23 defined area heights from 280 to 1820 mm in 70 mm increments
- 12 m maximum sensing range
- External device monitoring, auxiliary fault options and scan code select included (with 8-pin connectors)
- Automatic configuration (No DIP switches)
- IP65/IP67 environmental rating with IP69 models available
- Cascade capable models available
- Remote fixed blanking to ignore stationary objects
- Optional status indicator or fixed blanking control with cascade models
- Brackets and M12 QD pigtails included



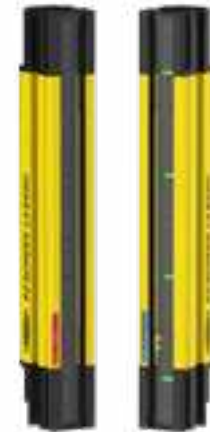
IP69 Hygienic Option Available

## LS Basic Series

### Basic Feature Heavy-Duty Type 4 Safety Light Curtain

The EZ-SCREEN® LS Basic Series offer the same rugged construction as standard LS light screens with a basic feature set.

- Basic models with limited options offer additional value for simple applications
- Heavy-duty aluminum housing and recessed window to avoid damage in harsh environments
- End-to-end sensing (no blind zone)
- Highly visible alignment and diagnostic indicators
- 23 mm resolution (detection capability)
- Available in ten defined area heights from 350 to 1820 mm
- 8 m maximum sensing range
- External device monitoring, auxiliary fault options and scan code select included (with 8-pin connectors)
- Automatic configuration (No DIP switches)
- IP65/IP67 environmental rating
- Brackets and M12 pigtails ordered separately



**M12 Pigtail**  
Euro-Style Quick Disconnect to LS Custom Male Straight Connector

**DELSE-51D (5-pin)**  
0.3 m (1 ft)

**DELSE-81D (8-pin)**  
0.3 m (1 ft)

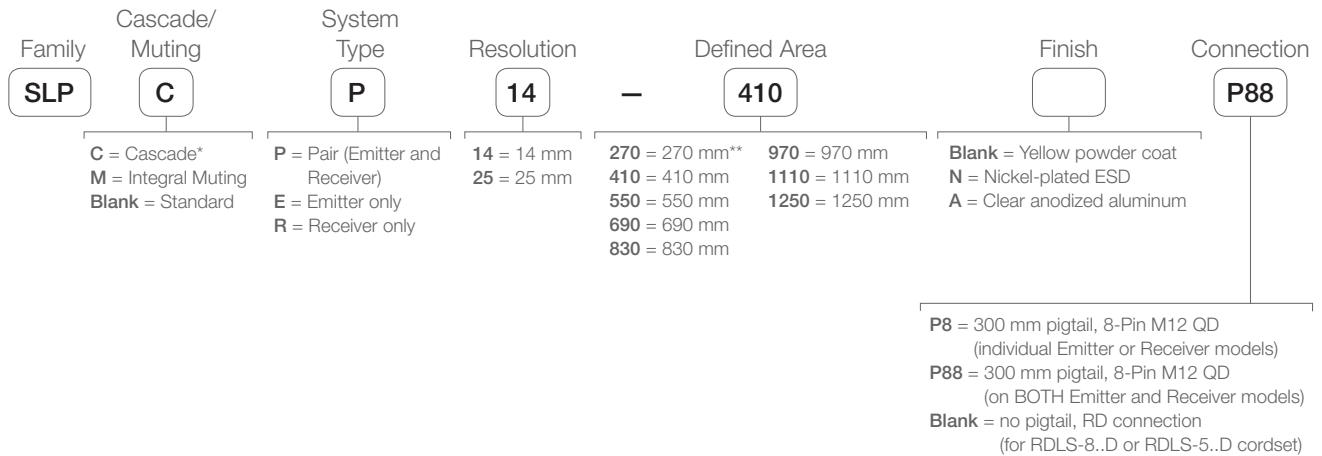


## LP Series

### Full Feature Compact Type 4 Safety Light Curtain

The space-saving, compact profile of the EZ-SCREEN® LP is ideal for smaller machines with an advanced feature set for a wide range of applications .

- Full featured models with options to meet a wide range of applications
- Low-profile, compact aluminum housing for smaller production machines
- End-to-end sensing (no blind zone)
- Highly visible alignment and diagnostic indicators
- Available in 14 or 25 mm resolutions (detection capability)
- 8 defined areas from 270 to 1250 mm in 140 mm increments
- 7 m maximum sensing range
- External device monitoring, auxiliary fault outputs, latching, blanking and scan code select included
- Available in nickel-plated housings for ESD-safe applications, clear anodized aluminum housing or “safety” yellow powder-coat housing
- Cascade capable models and models with integral muting available
- Brackets and M12 QD pigtails included



\* 8-pin Connection required for cascade models and to enable EDM, Aux Output and Reset features

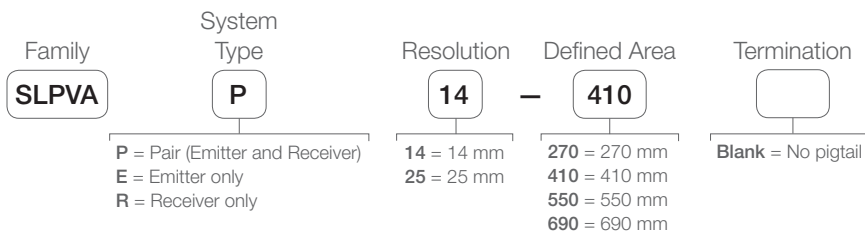
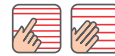
\*\* Not available for cascading

## LP Basic Series

### Basic Feature Compact Type 4 Safety Light Curtain

LP Basic Safety Light Curtains offer the same compact construction of the full feature LP, with a basic feature set.

- Basic models with limited options offer additional value for simple applications
- Low-profile, compact aluminum housing for smaller production machines
- End-to-end sensing (no blind zone)
- Highly visible alignment and diagnostic indicators
- Available in 14 or 25 mm resolutions (detection capability)
- Defined areas of 270, 410, 550, or 690 mm
- 4 m maximum sensing range
- Brackets and M12 QD pigtails included



**"RD" to M12 Pigtail**  
Euro-Style M12 Male QD to LP Custom "RD" Connector

<b>DELPE-51D (5-pin)</b> 0.3 m (1 ft)	<b>DELPE-81D (8-pin)</b> 0.3 m (1 ft)
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## SLC4 Series

Basic Feature, Very Compact Type 4 Safety Light Curtain

SLC4 safety light curtains are our shortest, most compact safety light curtains. They are designed to safeguard points of access and operation on smaller production machines and similar equipment.

- Basic models with limited options for additional value on simple applications
- Very compact aluminum housing with IP65 polycarbonate enclosure for smaller production machines
- End-to-end sensing (no blind zone)
- Highly visible alignment and diagnostic indicators
- Available in 14 or 24 mm resolutions (detection capability)
- Defined areas of 160, 240 and 320 mm
- 2 m maximum sensing range
- Integral 300 mm M12 QD Pigtail included
- Brackets sold separately



Family	System Type	Resolution	Defined Area	Termination
<b>SLC4</b>	<b>P</b>	<b>14</b>	— <b>160</b>	<b>P44</b>
	P = Pair (Emitter and Receiver) E = Emitter only R = Receiver only	14 = 14 mm 24 = 24 mm	160 = 160 mm 240 = 240 mm 320 = 320 mm	P4 = 300 mm pigtail, 4-Pin M12 QD (individual Emitter or Receiver models) P44 = 300 mm pigtail, 4-Pin M12 QD pigtails (Pair)

## SGS Series

### Safety Grid System

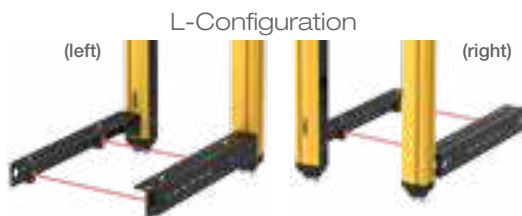
SGS Safety Grid Systems are cost-effective multiple beam safety light devices for access and long-range perimeter guarding applications. They are available in Emitter/Receiver models capable of safeguarding over very long distances and in easy-to-deploy Active/Passive models that offer additional cost savings.

- Models available with integral muting for entry/exit conveyors or palletizing cells
- Heavy-duty aluminum housing for tough environments
- Easy alignment and installation with on-board alignment lamp and indicators
- Protective heights of 500, 800, 900, or 1200 mm available
- Up to 60 m range available for perimeter guarding applications
- Mute arm kits available to simplify end-of-line packaging applications



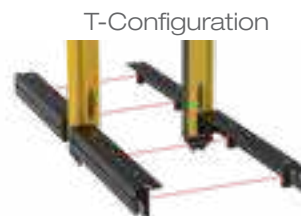
### Mute Arm Kits

Pre-assembled (with mounting hardware) for plug-and-play connection to the SGS grid and LS Safety Light Curtains



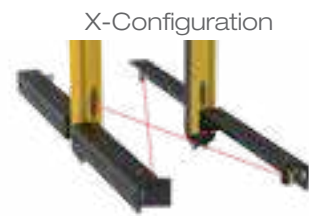
SGSA-ML-L-LPQ20

includes 2 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors



SGSA-MT-LPQ20

includes 4 mute arms, 4 SGSA-Q20PLPQ5 mute sensors, and 4 retroreflectors



SGSA-MX-LPQ20

includes 4 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors

### Emitter & Receiver

Type	Protective Height (mm)	Range (m)	Model
Emitter & Receiver	500 (2 beams)	6 to 60	SGSXP2-500Q88
	800 (3 beams)		SGSXP3-400Q88
	900 (4 beams)		SGSXP4-300Q88
	1200 (4 beams)		SGSXP4-400Q88
Emitter & Receiver	500 (2 beams)	0.5 to 30	SGSSP2-500Q88
	800 (3 beams)		SGSSP3-400Q88
	900 (4 beams)		SGSSP4-300Q88
	1200 (4 beams)		SGSSP4-400Q88
Emitter & Receiver with Integral Muting	500 (2 beams)	0.5 to 30	SGSMP2-500Q128
	800 (3 beams)		SGSMP3-400Q128
	900 (4 beams)		SGSMP4-300Q128
	1200 (4 beams)		SGSMP4-400Q128

### Active (requires Passive Mirror)

Type	Protective Height (mm)	Range (m)	Model
Active Transceiver	500 (2 beams)	0.5 to 8	SGSSA2-500Q8
	800 (3 beams)	0.5 to 8	SGSSA3-400Q8
	900 (4 beams)	0.5 to 6.5	SGSSA4-300Q8
	1200 (4 beams)	0.5 to 8	SGSSA4-400Q8
Active Transceiver with Integral Muting	500 (2 beams)	0.5 to 8	SGSMA2-500Q12
	800 (3 beams)	0.5 to 8	SGSMA3-400Q12
	900 (4 beams)	0.5 to 6.5	SGSMA4-300Q12
	1200 (4 beams)	0.5 to 8	SGSMA4-400Q12

### Passive Mirror

Type	Protective Height (mm)	Range (m)	Model
Passive Mirror Assembly	500 (2 beams)	Pair with Active Transceivers with matching beams and protective heights	SGSB2-500
	800 (3 beams)		SGSB3-400
	900 (4 beams)		SGSB4-300
	1200 (4 beams)		SGSB4-400

## SX5-B Safety Scanner System

- Maximum ranges for Safety Zone is 5.5 m and Warning Zone is 40 m
- 275 degrees of coverage makes it easy to safeguard a corner
- Dynamic Muting available and selectable detection capability for vertical applications
- Configurable for up to 6 zone sets
- Light Immune and dust resistant



Rugged design for reliable industrial use

27 different status, diagnostic, warning and error displays



Keypad

M12 Ethernet connector cover

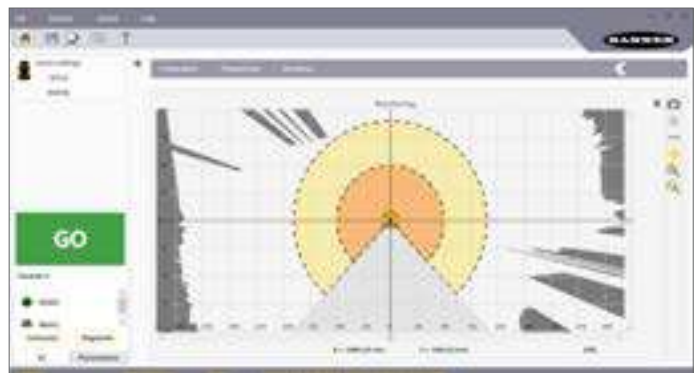


- LED 1: Object Detection in Safety Zone (OSSD)
- LED 2: Not Available
- LED 3: Assigned to Warning Zone 2
- LED 4: Assigned to Warning Zone 1
- LED 5: Interlock Status (waiting for Reset)

### Software

Communication between a PC and the SX5 via an Ethernet network. The SX5 is preprogrammed at the factory with a default configuration but must be reconfigured for each application.

- Administrative data: example file name, application description etc.
- Safety-relevant data: startup process information
- Safety Zone or Warning Zone configuration data: contours and limits





## Illuminated E-Stop Buttons

Patent pending highly visible illuminated base allows for easy identification of the status (armed, depressed/latched) of an individual e-stop or cascaded chain of e-stops to minimize downtime.

- Highly visible illuminated base shows armed status (off, green or yellow) and depressed/latched status (Red solid or flashing)
- Cascaded multiple illuminated e-stops for quick identification of armed state (all are yellow or green) or the e-stop that was pressed (red flashing) with the others in the chain red solid.
- Reduce installation time and cost with the Integral M12 QD and cascade connection accessories for plug-and-play connection
- Rugged design rated to IP65 with IP69 rated accessories available.
- Multiple size (40, 44, and 60 mm) and mounting configurations (30 mm and flush) available
- Latching design complies with ISO 13850 direct (positive) opening operation per IEC 60947-5-1



## Self-Checking Touch Buttons (STB)

- Provides highest level of safety for two-hand control input devices when combined with Banner AT Safety Module or Safety Controller
- Responds to a finger blocking light rather than to pressure to reduce fatigue
- Features ergonomic design to prevent repetitive motion stress
- Includes yellow field cover to prevent unintended switching
- Withstands exposure to a variety of chemicals, depending on model



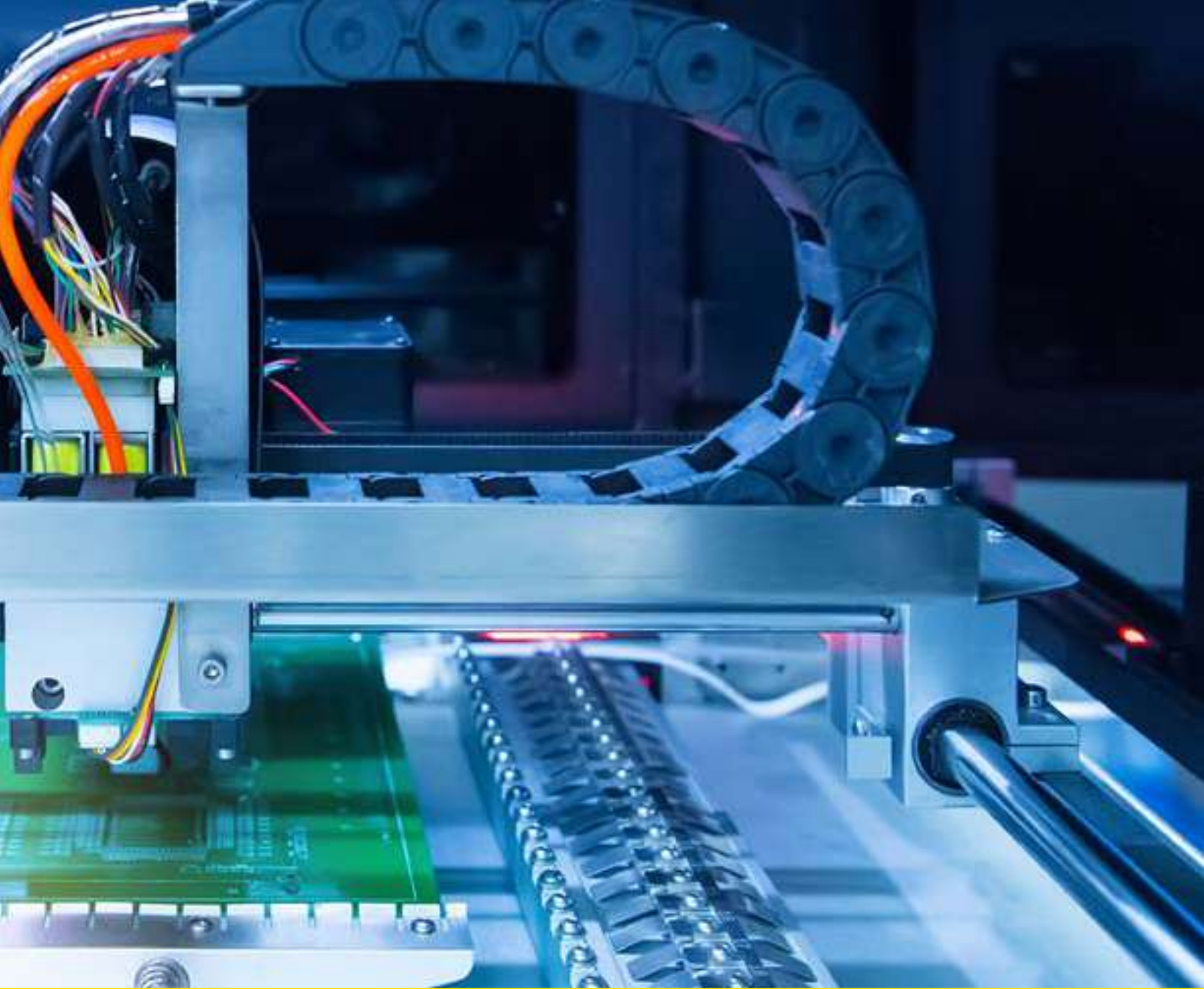
## Two-Hand Control Runbar

- Provides a convenient and economical means for two-hand control actuation when interfaced with DUO-TOUCH® SG Two-Hand Control Modules or Banner Safety Controller
- Offers ergonomic design for reduced hand, wrist and arm stress
- Offers model with emergency stop button and provides knockouts for wiring flexibility and installation of accessory EZ-LIGHT™ indicators
- Offers optional telescoping stands and brackets









# Machine Vision

Vision sensors, smart cameras, and vision lights from Banner combine high performance tools, intelligent features, and an intuitive user interface. They are cost-effective, easy-to-deploy, easy-to-use solutions capable of solving thousands of applications, from simple feature verification to complex, high-speed inspections. Banner's vision software and firmware updates are always available for full download free of charge.

# Selection Guide | Vision Sensors and Cameras


## Vision Sensors

Robust yet easy-to-use self-contained vision sensors perform automated inspections that previously required costly and complex vision systems.

Series	Configuration Options	Sensors	Imager	Integrated Lighting	Communications	Page # or Web
 iVu	Touchscreen, PC	Match Area Blemish Sort	WVGA (752x480) Grayscale	Red Blue Green White UV365 UV395 Infrared	EtherNet/IP™ Modbus/TCP PROFINET® PCCP RS-232	58
 iVu Color	Touchscreen, PC	Average Color Color Area Color Compare Match Area Blemish Sort	WVGA (752x480) Color	White	EtherNet/IP™ Modbus/TCP PROFINET® PCCP RS-232	58
 iVu BCR	Touchscreen, PC	2D Barcodes 1D Barcodes	WVGA (752x480) Grayscale	Red Blue Green White UV365 UV395 Infrared	EtherNet/IP™ Modbus/TCP PROFINET® PCCP RS-232	58

## Smart Cameras

Smart cameras are easy-to-use and offer powerful inspection tools and capabilities to solve a broad range of applications.

Series	Configuration Options	Tools	Imager	Integrated Lighting	Communications	Page # or Web
 VE	PC	BLOB Bead Locate Match Math Line Detect Circle Detect Average Gray Edge Blemish Logic Measure Object	WVGA (752x480) 1.3 MP (1280x1024) 2 MP (1600x1200) 5 MP (2592x2048) Grayscale	Lights Sold Separately	EtherNet/IP™ Modbus/TCP PROFINET® PCCP RS-232	60

# Vision Lighting

Vision lighting is the key to creating all-important contrast between the feature of interest and its background.

Lighting Technique	Description	Series	Page # or Web
 <p>Backlight</p>	<p>The part being inspected is placed between the camera and a bright, even light source. The result creates a silhouette of the target which is useful in edge detection, part presence and measurement applications.</p>	 <p>Backlights Linear Array Backlights</p>	
 <p>Ring Light</p>	<p>A ring light is affixed to the camera and both items can be mounted as one piece for convenience. This setup is good for relatively small parts or close up applications.</p>	 <p>Ringlights</p>	
 <p>Directional Light</p>	<p>Directional lights create shadows to detect changes in depth, illuminate specific surface angles, and avoid glare of reflective surfaces when directed at an angle away from lens.</p>	 <p>Area Lights Ring Lights Linear Array Lights</p>	
 <p>Low Angle Ring Light</p>	<p>Also called a dark field illuminator, this specialty light has its LEDs mounted in a ring, pointing toward the part almost perpendicular to the camera's direction of view. Low Angle Ring lights create shadows and bright spots to detect changes in depth.</p>	 <p>Low-Angle RingLights</p>	
 <p>On-Axis</p>	<p>On-Axis, or coaxial, lights generates light that travels along the same axis as the camera's direction of view. The camera looks down from the top, through the On-Axis light, to the target part below. This technique can be use to eliminate shadows, inspect shiny object or inspect for height changes.</p>	 <p>On-Axis Lights</p>	
 <p>Structured Light</p>	<p>A laser line generator is an example of a structured lighting scheme. This technique uses a high quality, uniform laser line to infer the presence of a difficult to see target. As a three-dimensional part passes through the laser line's path, the image of the laser becomes distorted so the camera can detect the part.</p>	 <p>Laser Line Generators</p>	



## iVu Series Vision Sensors

The iVu and iVu Color Vision Sensors are used to monitor parts for type, size, orientation, shape, location, and color or color variations. The following features are available:

- Configure in minutes using Vision Manager PC software, onboard touchscreen display or using remote touchscreen to access to hard to reach places
- All-in-one solution with camera, controller, lens, and light included in one package
- Inspect multiple features with a wide variety of grayscale or color tools
- Compact, rugged, IP67 housing available with a variety of integrated ring lights including red, blue, green, white, infrared or UV
- Interchangeable lenses, including C-mount, for maximum application flexibility
- Factory communications (EtherNet/IP™, Modbus/TCP, PROFINET®, PCCC and Serial RS-232) for integration on the manufacturing floor
- Ability to change parameters on the fly with full runtime editing to reduce costly downtime

Family	Touchscreen	Sensor Type	Ring Light Color	Lens (mm)
<b>IVU2P</b>	<b>TG</b>	<b>TG</b>	<b>R</b>	<b>04</b>
	TG = Integrated RG = Remote*	C = Color† G = Grayscale B = Barcode	R = Red B = Blue G = Green W = White I = Infrared 6 = UV365 9 = UV395 XC = C-mount** X = No Ring Light	04 = 4.3 06 = 6 08 = 8 12 = 12 16 = 16 25 = 25 Blank = No lens (only C-Mount)

\* Remote touchscreen or PC is required for set up and viewing of sensors with a remote touchscreen

\*\* Requires C-mount lens

† Color sensor only available in white, C-mount or no ringlight





Label detection using a Match Sensor



Hardware sortation using a Sort Sensor



Blister pack inspection using an Area Sensor



Cap verification using a Color Area Sensor



Detect flaws on web using a Blemish Sensor



Trim color verification using an Average Color Sensor



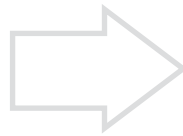
## VE Series Smart Camera

VE Series Smart Cameras solve a wide range of vision applications, such as item detection, part positioning, feature measurement and flaw analysis

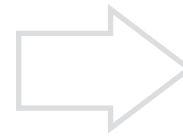
- Available in 5MP (2592 × 2048 pixels), 2MP (1600 × 1200 pixels), 1.3MP (1280 × 1024 pixels), and WVGA (752 × 480 pixels) models, all with the same powerful inspection capabilities
- Runtime editing capability reduces costly downtime and the software emulator allows for offline building and troubleshooting of applications
- Factory communications (EtherNet/IP™, Modbus/TCP, PROFINET®, and Serial RS-232) for integration on the manufacturing floor
- Built to stand up to industrial environments



Select a camera resolution



Choose lens based on Field of View (FOV) and Working Distance (WD)



Optional filters create additional contrast

## Durable Design



Robust, aluminum housing for harsh environments

C-mount lens for a variety of applications

## Status and Troubleshooting



Bright LED indicators to easily view camera status

Two-line, eight-character display and push buttons for troubleshooting and viewing camera status

- Perform product change or trigger
- Troubleshoot and clear errors
- Change or view IP address, MAC address, or Ethernet speed
- View firmware, focus number or status

## Connections



Ethernet connector with Gigabit Ethernet communication speed

Discrete communication to external devices using five user-configurable optically isolated I/O

Power Banner vision lights directly from the camera



IP67 lens covers or ring lights available for additional protection

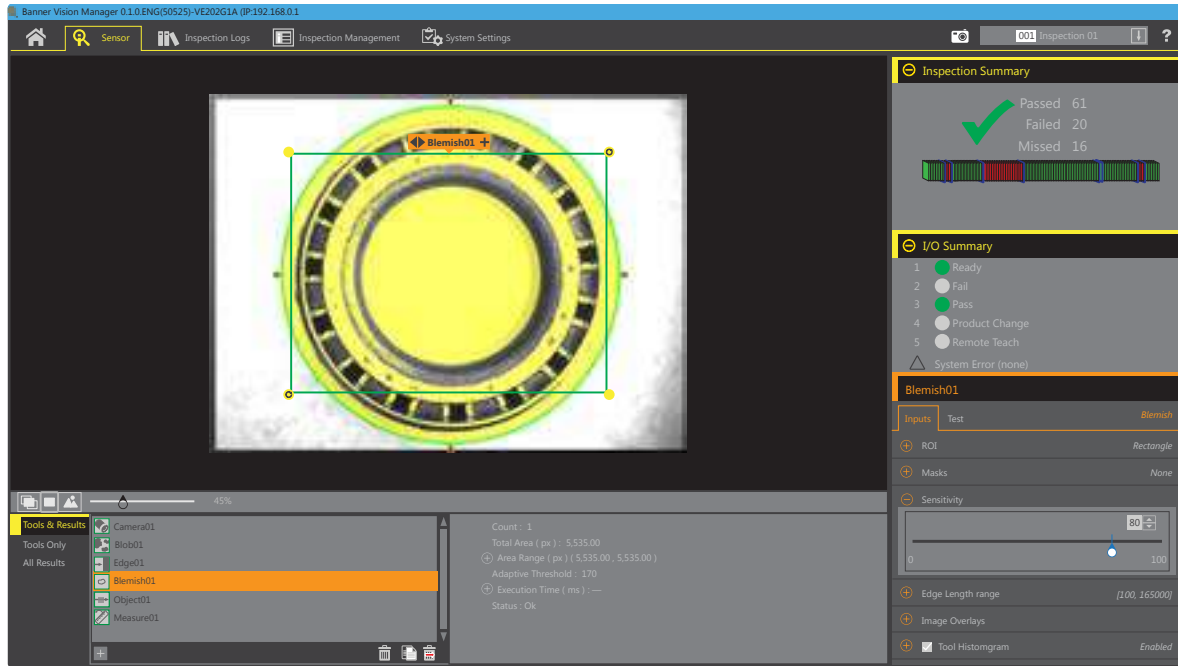
Family	Resolution	Imager	Ethernet Connection
<b>VE</b>	<b>202</b>	<b>G</b>	<b>1A</b>
	200 = WVGA, 752 x 480 pixels 201 = 1.3 MP, 1280 x 1024 pixels 202 = 2 MP, 1600 x 1200 pixels 205 = 5 MP, 2592 x 2048 pixels	G = Grayscale	1A = M12, 8-pin Euro-style female



# Machine Vision

## Vision Manager Software

Combining intuitive operation with powerful inspection tools, the Vision Manager software makes it easy for users of any experience level to solve challenging vision and barcode reading applications. The software is free, easy-to-use, and fully compatible with VE Series smart cameras, iVu Series vision sensors, and iVu barcode readers from Banner Engineering.



### Make Machine Vision and Barcode Reading More Intuitive

Vision Manager software takes the complexity out of vision and barcode reading applications. It features a graphical user interface and menu-driven tools that guide users through inspection setup and device management. Users of any experience level can easily navigate the intuitive operating environment and get their system up and running within minutes.

### Build Better Inspections with No Downtime

Create new inspections, troubleshoot existing inspections, or explore the capabilities of your system offline using the Vision Manager software emulator. Use runtime editing to update inspections while they are in progress without costly downtime from stopping and restarting inspections.

### Solve More Applications

This robust software platform provides a full set of powerful tools to solve thousands of applications, from simple feature verification and barcode reading to complex inspections on multiple objects or those requiring feature measurement, flaw analysis, or other advanced capabilities.



Compatible with both the iVu and VE



Door panel adhesive inspection using Bead Tool



Correct carton inspection using Match Tool



Blister pack inspection using BLOB Tool



Cell phone inspection using Measure and Match Tools



Empty sortation conveyor inspection using Blemish Tool












# Barcode Readers

Banner Engineering provides advanced barcode reading capabilities for traceability in a wide variety of industries. We offer rugged, reliable solutions that ensure quality, improve efficiency, and enable accurate inventory management.

# Selection Guide | Barcode Readers

Advanced barcode reading capabilities for advanced traceability in a compact, rugged package. Banner's barcode readers also feature Ethernet communications.

Series	Reader Type	Configuration Options	Max. Reading Range*	Focus Type	Communication	Dimensions H x W x D (mm)	Page # or Web
 ABR 3000	Imager-based (1D, 2D)	Push Button PC	285 mm	Manual Focus	EtherNet/IP™ Modbus/TCP RS-232 RS-422 USB	Ethernet 45 x 24 x 49 USB 45 x 24 x 31	30
 ABR 7000	Imager-based (1D, 2D)	Push Button PC	800 mm	Manual focus Autofocus	Ethernet/IP™ Modbus/TCP RS-232 RS-422	75 x 54 x 43	30
 iVu BCR	Imager-based (1D, 2D)	Touchscreen PC	Lens Specific	Manual Focus	EtherNet/IP™ Modbus/TCP PROFINET® PCCC RS-232	95 x 81 x 52	70
 TCNM	Laser Scanner (1D)	Push Button PC	600 mm**	NA	RS-232	68 x 83 x 33	

\* For 20 mil 2D Code  
\*\* For 20 mil 1D code



Barcode reading for food traceability



Direct Part Mark (DPM) code reading and verification on automotive part



Barcode detection on semiconductor wafer



Read barcode on shipping label



## ABR Barcode Imager-Based Barcode Readers

ABR series barcode readers offer superior decoding capability and are available in two compact form factors, multiple resolutions, and a wide range of lens options.

- Powerful decoding capability to read even difficult 1D and 2D codes, including Direct Part Mark (DPM) and low contrast codes
- Compact metal housing for industrial environments
- Quick configuration with on-board push buttons or a PC using Barcode Manager, Banner's free operating software featuring an intuitive operating environment and advanced capabilities to solve the most difficult barcode reading applications
- Versatile lens options are available to simplify setup and configuration, including a software adjustable autofocus (ABR 7000) which easily adapts to changes in read distance
- Factory communication options include Ethernet/IP™, Modbus/TCP, Serial or USB for integration on the manufacturing floor
- Embedded webserver interface for monitoring images and statistics over any network



## Barcode Manager Software

Connect, configure, and monitor multiple ABR series barcode readers using Barcode Manager. This powerful software features intuitive, flowchart programming that makes it easy to setup inspections and access advanced features to solve the most difficult barcode reading applications.

### Quick and Easy Inspection Setup and Management

A wide range of configuration options, including a one-step process for automatic setup and an advanced option that provides full access to change and configure device settings.

### Remote Monitoring and Management

The web interface makes it possible to setup, manage, and monitor multiple barcode readers from any network-enabled location, providing users with tremendous flexibility in managing devices

### Identify Problems Early On

Code grading allows barcode readers to evaluate the quality of each barcode, making it easy to identify and resolve code issues early.

### Extend the Inspection Area

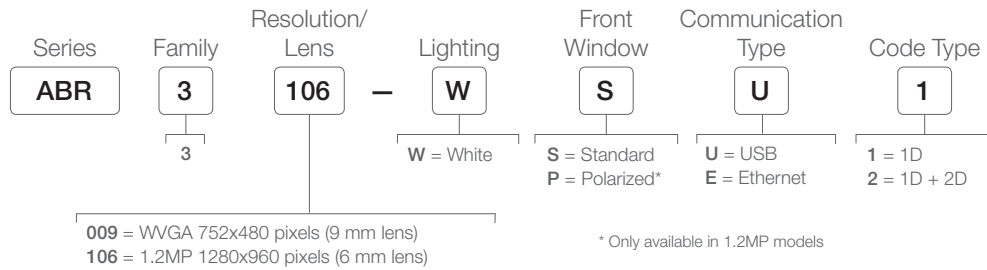
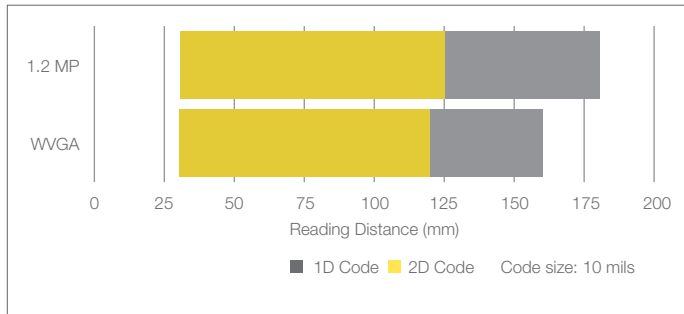
With multihead networking users can connect multiple barcode readers together in a network to solve complex applications over a very large inspection area.

## Capable of reading the following codes

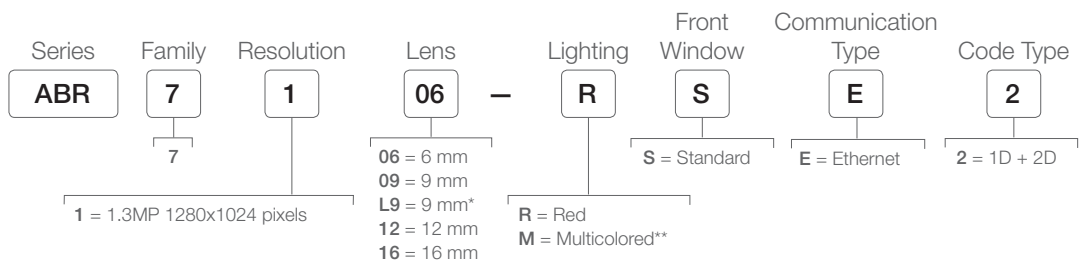
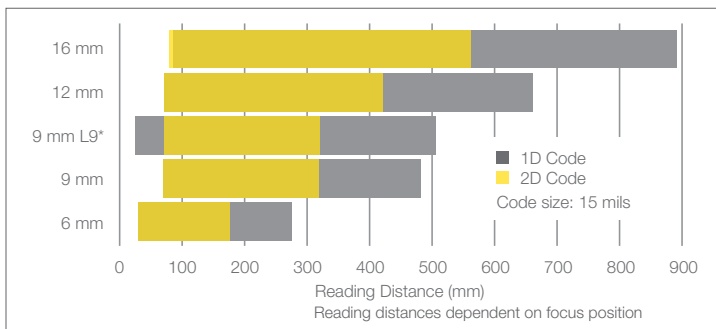
1-D and Stacked		2D	Postal
<ul style="list-style-type: none"> <li>• PDF417 (Standard and Micro)</li> <li>• Code 128 (GS1-128)</li> <li>• Code 39 (Standard and Full ASCII)</li> <li>• Code 32</li> <li>• MSI</li> <li>• Standard 2 of 5</li> <li>• Matrix 2 of 5</li> </ul>	<ul style="list-style-type: none"> <li>• Interleaved 2 of 5</li> <li>• Codabar</li> <li>• Code 93</li> <li>• Pharmacode</li> <li>• UPC (EAN-8/13, UPC-A/E)</li> <li>• GS1 DataBar Family</li> <li>• Composite Symbolologies</li> <li>• Plessey</li> </ul>	<ul style="list-style-type: none"> <li>• Data Matrix ECC200 (Standard, GS1 and DPM)</li> <li>• QR Code (Standard and DPM)</li> <li>• Micro QR Code</li> <li>• MAXICODE</li> <li>• Aztec Code</li> <li>• Dotcode</li> </ul>	<ul style="list-style-type: none"> <li>• Australia Post</li> <li>• Royal Mail 4 State Customer</li> <li>• Kix Code</li> <li>• Japan Post</li> <li>• PLANET</li> <li>• POSTNET</li> <li>• POSTNET (+BB)</li> <li>• Intelligent Mail</li> <li>• Swedish Post</li> </ul>



## ABR 3000



## ABR 7000



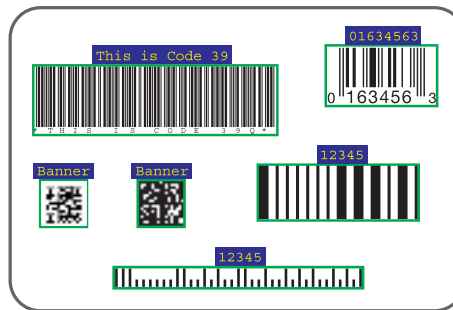
\* Liquid lens autofocus

\*\* Red and blue LEDs for optimized reading of DPM codes, available on 6 mm and 9 mm models only



## iVu Barcode Reader Powerful 1D and 2D Barcode Reader

- Program through integrated touchscreen, remote touchscreen or PC interface
- Reads a variety of 1D and 2D barcodes
- Ethernet (EtherNet/IP™, Modbus/TCP and PROFINET®) and Serial RS-232 communications
- Read multiple barcodes in any orientation with one device
- Rugged IP67 housing for factory environments
- Available with a variety of lens and integrated light options – red, blue, green, white, UV or infrared

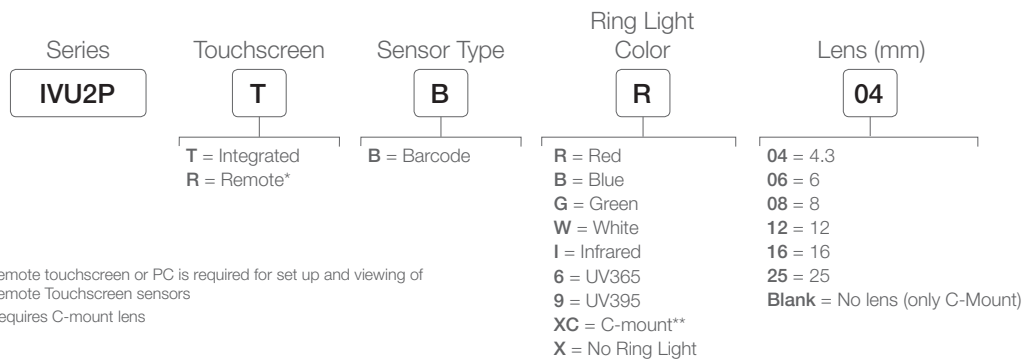


### 2D Barcodes

- Data Matrix ECC200
- QR code
- Micro QR code

### 1D Barcodes

- Code 128
- Code 39
- Codabar
- Interleaved 2 of 5
- UPC-E (EAN-8/13, UPC-A/E)
- EAN-8
- IMB
- Postnet
- Pharmacode



# Barcode Readers



Read barcode on shipping label



Label verification on labeler machine







# Lighting & Indication

Banner's expansive selection of LED light fixtures, tower lights, indicators, and actuators shine brilliant and bright to provide superior-quality illumination, clear status indication, and unmistakable operator guidance and offer the low-power, long-life, maintenance-free advantages offered by LED technology.

# Lighting & Indication



Pro products give users flexibility to customize their machine's communication and streamline their supply chain. Full capabilities and dynamic response are available through IO-Link. The Pro Editor software allows fast customization of discrete controlled products. Programming hardware is compatible with all devices, and the software is free.

## Key Benefits

**Give your machines a voice:** More color and animation options allow for more intuitive indication in the visual factory. Show material level, process time, warmup status and more.

**Gain control of your supply chain:** Programmable RGB indicators make supply chains more efficient by allowing you to standardize on one model of indicator that can be customized as needed.

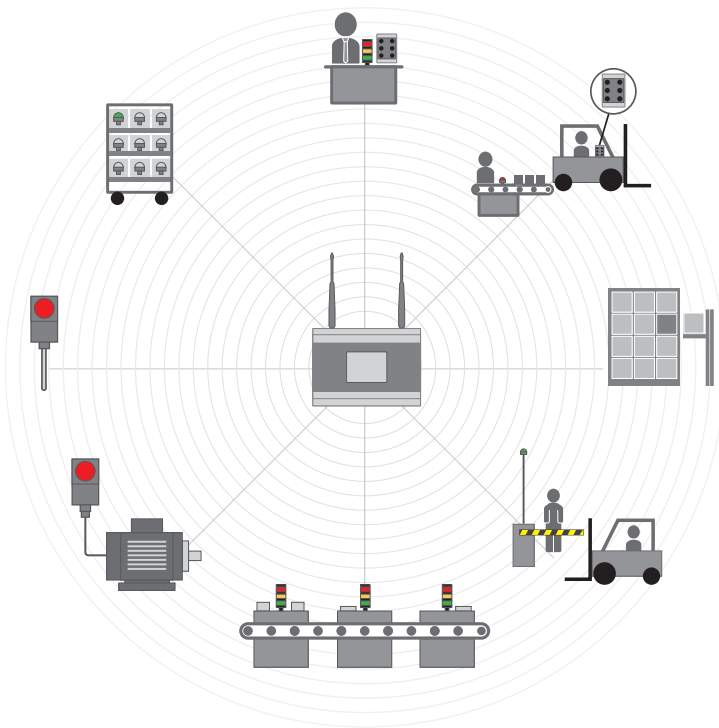
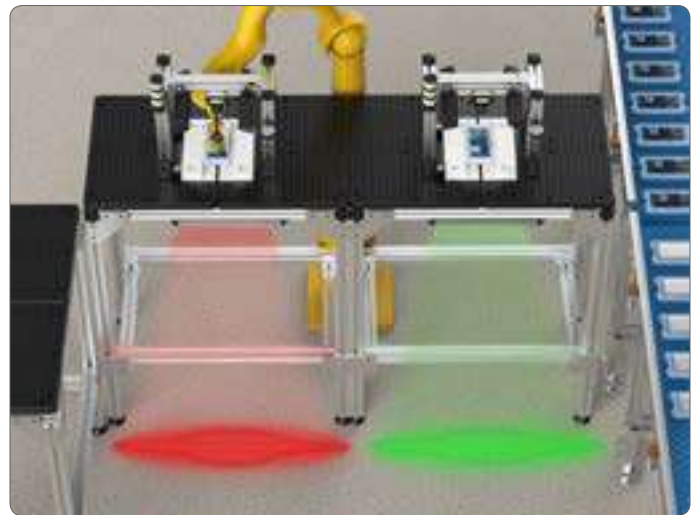
**Customize indication without additional lead time:** Choose from a wide variety of colors and animations to match process requirements, and preview settings on the device before deployment.

**Configuration options:** Control the animation state, color, intensity, speed, pattern, animation direction, and audible options, plus logic and wiring.



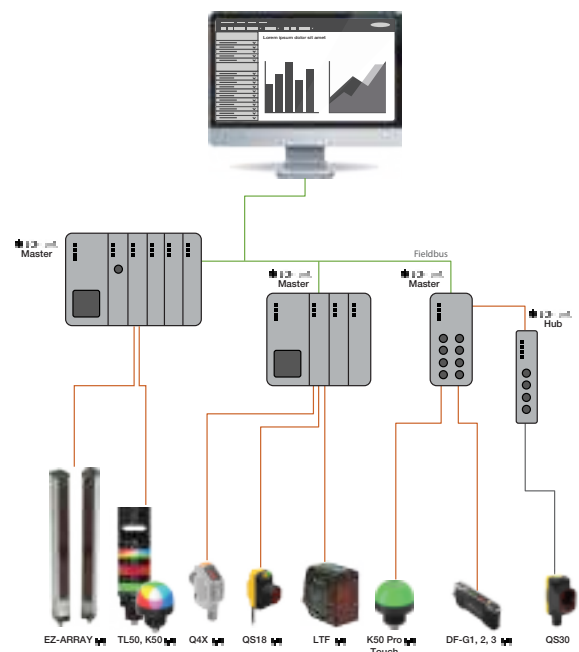
## EZ-STATUS®

- Multiply the value of your device – adding indication to illumination unlocks countless new applications.
- EZ-STATUS® multicolor lights give clear status information in addition to valuable machine illumination.



## Advanced Communication Options


IO-Link, wireless and serial communication options provide advanced configuration, remote control and monitoring capabilities, custom colors, dynamic indicator responses, and diagnostic information.





























# Selection Guide | LED Task Lighting

Banner Engineering's industrial LED lighting products are high-quality and energy-efficient lights that provide bright illumination for 50,000 hours or more. Robust, vibration-resistant housings and sleek designs make Banner Engineering's LED lighting ideal for a wide range of industrial applications, including machine lighting, enclosure lighting, visual inspection illumination and work cell lighting.

Series	Length	AC/DC	White Lumens/Ft (300 mm)	Color Options	Environmental Rating	Special Considerations	Page # or Web
 WLS28-2	145 to 1130	DC	800		Unsealed IP50 Sealed IP67, IP69K	  EZ-STATUS®	
 WLS27	145 to 1130	DC	800		IP66 IP67 IP69K	   EZ-STATUS®  	
 HLS27	145 to 1130	DC	850		IP66 IP67		86
 WLS15	220 to 1200	DC	350		IP66 IP67	 EZ-STATUS®	
 WLB32	285 to 1130	AC DC	750		IP50		
 WLB92	550 and 1100	AC DC	1750		IP40		




**KEY**

-  Cascadable
-  Water Resistant
-  Hazardous Location
-  High Temp
-  Chemical Resistant






Series	Length	AC/DC	White Lumens/Ft (300 mm)	Color Options	Environmental Rating	Special Considerations	Page # or Web
 WLC60	340 and 640	DC	1300		IP68 IP68g IP69K		
 WLH60	340 and 640	DC	1150		IP68 IP69K		
 WLC90	89 x 91	DC	700		IP68 IP68g IP69K		
 WLA	105 x 180 to 360 x 180	DC	550		IP67 IP69K		
 WL50S	ø 50	DC	295		IP67 IP69K		
 WL50-2	ø 50	DC	225		IP67 IP69K		

# Selection Guide | Tower Lights

Preassembled and preconfigured multi-segment LED tower light indicators replace conventional stack lights, which often require time-consuming assembly and complex wiring. Various tower light models result in customized solutions, including a choice of ac or dc supply power, three audible output options, standard or high light intensities and quick-disconnect or pre-wired options.

Family	Diameter (mm)	AC/DC	Max Segments	Color Options	Environmental Rating	Special Considerations	Page # or Web
 TL70	70	AC DC	6		IP65		
 TL50	50	AC DC	10		IP67		
 TL50C	50	AC DC	10		IP67		
 TL50BL	50	AC DC	10		IP67		
 CL50	50	AC DC	1		IP67		
 TL30	30	DC	5		IP65		86

































**KEY**

-  Multicolor
-  Audible
-  Daylight Visible
-  Wireless
-  Modular Segments









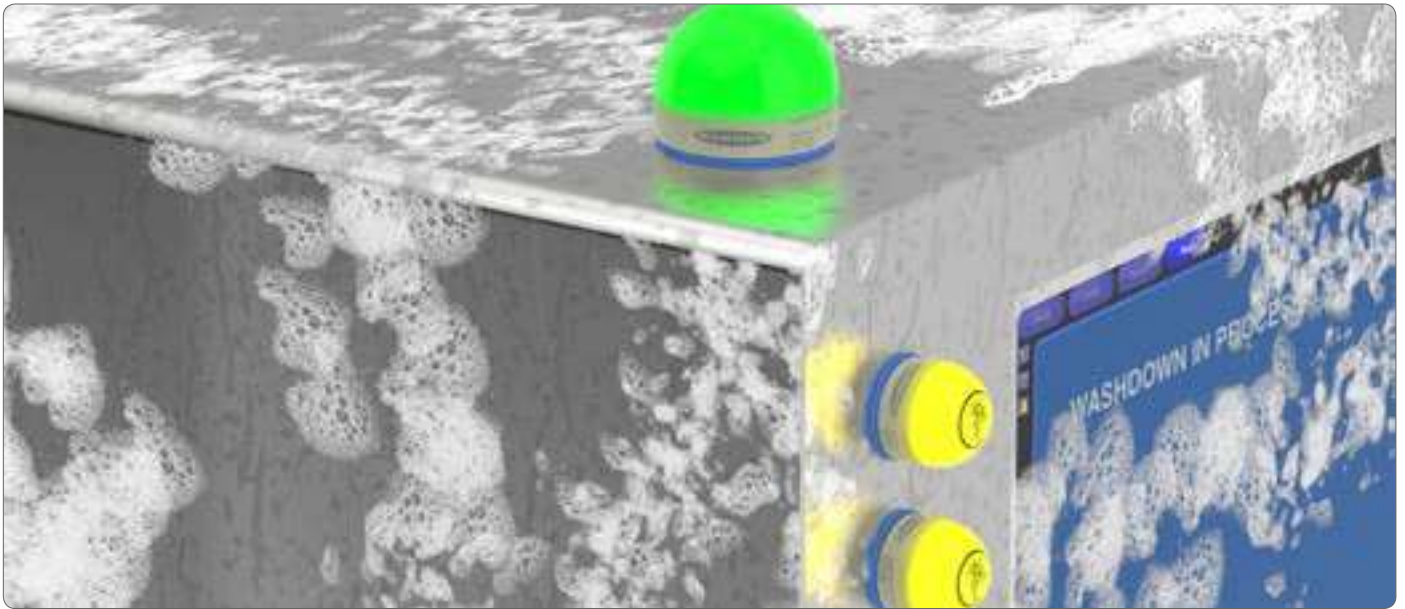
# Selection Guide | LED Indicators

Banner Engineering's LED indicators offer a wide variety of bright, highly visible models ranging from daylight visible to multiple colors in one device. Indicators have a rugged design for long-term use and require no additional protective box.

Series	Dome Size (mm)	Mounting Hole Dia. (mm)	AC/DC	Color Options	Environmental Rating	Special Considerations	Page # or Web
 K30 Pro K50 Pro K50C Pro	30 50 50	22 30 30	DC	7, 14 colors more with IO-Link	IP66 IP67 IP69		
 K30L K50L	30 50	22 30	AC DC	K30: 1-3 colors K50: 1-5 colors	IP67 IP69K		
 K50FL	50	Flat Mount	DC	1-5 colors	IP67 IP69K		
 K50BL	50	30	AC DC	1-3 depending on model	IP67 IP69		
 K70L	70	30	DC	1-5 colors	IP65		
 K90L	90	30	DC	1-5 colors	IP67		
 K80FL	66	Flat Mount	DC	1-9 colors	IP67		
 K80	50	Flat Mount	AC DC	1-5 colors	IP67		
 SP Series	50	Flat Mount	AC DC	1-3 colors	IP67		
 S22 Pro	20	22	DC	1-14 colors	IP65 IP67 IP69K		87
 S18L S22L	18	18 22	DC	1-3 colors	IP67 IP69K		

**KEY**
























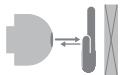


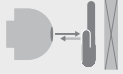
















					
Multicolor	Audible	Daylight Visible	Flash	Wireless	Hazardous Location







# Selection Guide | Touch Buttons

Banner is the leader in ergonomic, visual and sealed operator touch buttons for industrial applications. Since Banner touch buttons can have multiple colors and I/O capabilities, they can replace several conventional buttons, making them ideal in lean manufacturing environments.

Series	Size (mm)	Mounting Hole (mm)	Actuation Method	Color Options	Environmental Rating	Special Considerations	Page # or Web
 S22 Pro	20	22		7, 14	IP66 IP67 IP69K	 	87
 K30	30	22			IP67 IP69K		
 K50 K50 Pro	50	30		Pro: 7, 14 IO-Link: More	IP67 IP69K	  	87
 K70	70	30			IP65	 	
 K30L/K50L Push Button	30 50	22 30			IP65		
 OTB	74.2 x 59.9 x 43.2	30		NA	IP65		
 VTB	73.3 x 43.2 x 43.2	30			IP65		
 Flush-Mount Illuminated E-Stops	102.1 x 80.8 x 80.3	NA			IP65	 	
 Illuminated E-Stops	119.8 x ø 80	30			IP65 IP69 with cover	 	
 OS80	119.8 x ø 80	30			IP40 IP69 with cover		




















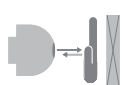







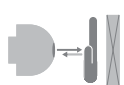





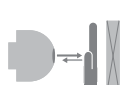

**KEY**

-  Cascadable
-  Multicolor
-  Audible
-  Daylight Visible
-  Wireless

# Pick-To-Light

Pick-to-light sensors help industrial automation manufacturers reduce the risk of error in the assembly process, boosting product quality and reducing cost.



Series	Size (mm)	Mounting Hole (mm)	Actuation Method	Color Options	Environmental Rating	Special Considerations	Page # or Web
 PTL	35 x 110 x 30	NA	 and/or	14	IP54		84
 S22 Pro	20	22		7, 14	IP66 IP67 IP69K		87
 K30	30	22			IP67 IP69K		
 K50 K50 Pro	50	30		7, 14	IP67 IP69K		87
 K70	70	30			IP65	 	
 K50 Optical	50	30			IP67 IP69K		
 K30/K50/K80 Push Button	30 50 80	22 30 NA			IP65		
 PVD	Sensing Length 100 or 225	NA		NA	IP62		
 PVA	Sensing Length 100 225 300 375	NA		NA	IP62		
 PVL	Sensing Length 225 or 500	NA		NA	IP50		

## PTL110 Scalable, Versatile Pick-to-Light Solution

- Achieve fast picking speeds in large scale systems with PICK-IQ™ serial communication
- Optimize application performance with options including optical sensor, touch button and display
- Reduce system costs with simple mounting and direct device connection



Built-in holes for easy mounting using zip ties



Mounting options are available for fast installation and part moves



Three-digit display to show pick count and more

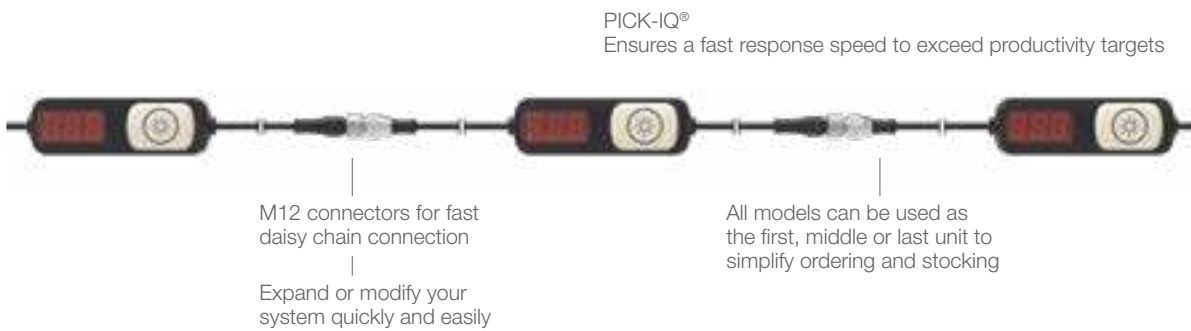
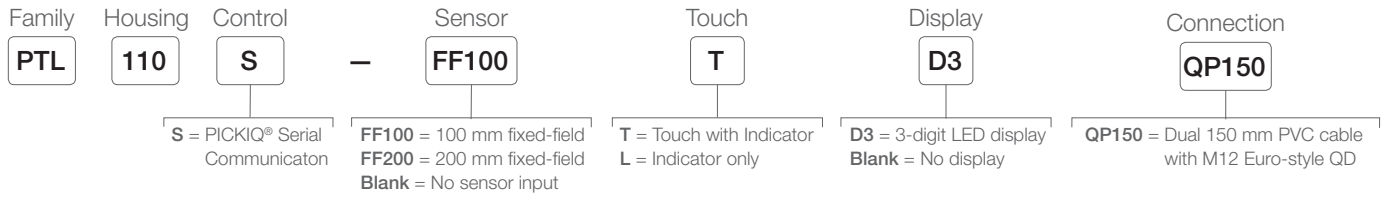
Touch button provides a reliable manual interface



Built-in optical sensor for direct pick detection



Define primary and secondary sensor functions to expand capabilities of a single device



## Monitor and Control

PTL devices are controlled by Modbus master



Customizable indication with up to 14 colors gives maximal visual clarity



### DXM700 Controller

- Use as master device for protocol conversion and system initialization
- Collect pick metrics for analysis and system optimization
- Choose an embedded radio model for wireless installations

# Lighting & Indication

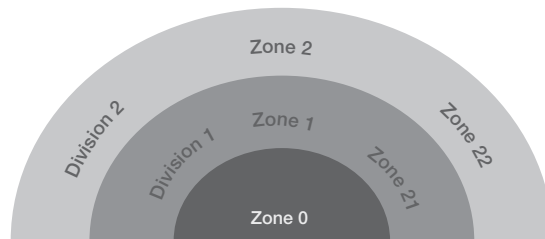
## TL30 Basic 30 mm Tower Light



## HLS27 Hazardous Location LED Strip Lights



- Certified for use in Class I Division 2, Class II Division 2, Class III Division 1 & 2, and Zone 2 & 22 locations
- Single- and dual-color models for advanced signaling, inspection and other applications
- Custom brackets make mounting easy and protect against impact
- Intensity control via Hi/Lo/Off wiring or PWM dimming



Models with 2.0 (6.3 ft) ITC-ER cable and unterminated tinned leads:

NEC and CEC:

Gas & Vapors: Class I Zone 2 IIC T4 / Class I Div 2 Groups ABCD T4

Dust: Class II Zone 22 IIIC T100°C / Class II Div 2 Groups FG T5

Fibers: Class III Div 1 and Div 2 T5

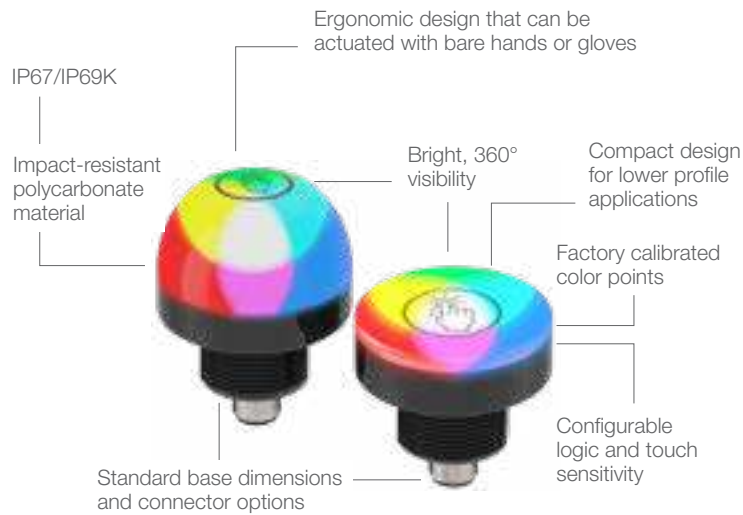
ATEX/IECEX:

Gas & Vapors: II 3 G Ex ec IIC T4 Gc (Group IIC Zone 2)

Dust: II 3 D Ex tc IIIC T85°C Dc (Group IIIC Zone 22)



## K50 Pro Touch Buttons

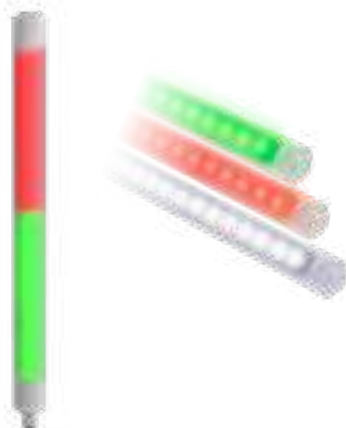


## S22 Pro Touch Buttons and Pro Indicators



- Large, bright illuminated area for clear visibility
- IP69K design for washdown environments
- Flush mount design sits tight against surfaces
- Terminal and cable options for fast, economical installation
- Bimodal inputs (PNP/NPN) for part count reduction
- FDA-grade models available
- Pro Editor software compatible

## WLS27 LED Strip Lights



- The popular IP69-rated, chemically-resistant housing adds new electronics
- Pro models enhance illumination, status indication and process feedback applications
- Controlled by IO-Link or configured via Pro Editor software for discrete control
- Segmented core models replace tower lights and stop lights, or add multiple indication states to machinery
- EZ-STATUS® models provide discrete control of three or five colors, perfect for adding indication to illumination



Avoid nuisance maintenance and replacement expense



Select compliant models for use in food and beverage processing



Adjustable touch sensitivity



Excellent immunity to false triggering in washdown environments



Simplify ordering, stock and spare parts with flexible, customizable units



details on the Pro Editor software





















# Connectivity & Monitoring

Wireless products from Banner connect remote assets with the people who manage them, enabling real-time monitoring and management of equipment and conditions in difficult-to-access locations or where wired solutions are impractical, ineffective or cost-prohibitive.



# Selection Guide | Industrial Wireless Radios

Easily replace discrete, analog, serial, and ethernet signal wires. With no setup software needed, data radios are easy to apply, use, and support. With wireless I/O, you can create expandable point-to-multi-point wireless networks that distribute I/O over large areas

Series	Description	Page # or Web
 <p>PM Series – Wire Replacement</p>	An I/O radio network that combines long range line-of-sight coverage with ease of deployment and use. The PM2 Series has four sourcing discrete inputs, four sourcing discrete outputs, two analog inputs and two analog outputs in both the Gateway and the Node.	
 <p>Performance Series Gateways and Nodes</p>	Create point-to-multi point networks that distribute I/O over large areas. Input and output types include discrete (dry contact, PNP/NPN), analog (0 to 10 V dc, 0 to 20 mA), temperature (thermocouple and RTD), and pulse counter.	
 <p>Performance Series Basic Nodes</p>	The Performance Series P6L Node is low-cost, battery-powered device that can convert Banner 1-wire serial sensor device into a wireless input. All configuration is done through internal DIP switches or the DX80 User Configuration Tool.	
 <p>MultiHop Modbus I/O Data Radios</p>	MultiHop Modbus Data Radios extend the range of Modbus or other serial communication networks. Each radio may be set to act as either a master, repeater or slave. Models are available with built in discrete and analog I/O, which can be accessed using the Modbus protocol.	
 <p>Ethernet Data Radios</p>	Sure Cross® MultiHop Ethernet Data Radios are wireless industrial communication devices used to create point to multipoint configurations of wireless Ethernet networks.	
 <p>Serial Data Radios</p>	Sure Cross® MultiHop Serial Data Radios are wireless industrial communication devices used to extend the range of serial communication networks.	
 <p>Hazardous Area Radios – Metal Housing</p>	Hazardous area radios are a state-of-the-art combination of wireless communication, battery technology and intrinsically safe electronics. Networks are formed using DX80 Performance Gateways installed beyond the hazardous area and one or more Nodes operating in the same frequency band.	

## Wireless Controllers


















Industrial wireless controllers that facilitate Ethernet connectivity and Industrial Internet of Things (IIoT) applications.

Series	Description	Page # or Web
 <p>Industrial Wireless Controller: DXM Series</p>	The DXM controller series integrates Banner's wireless radio, cellular and Ethernet connectivity, and local I/O to provide a platform for the Industrial Internet of Things (IIoT).	97
 <p>Wireless Solutions Kit</p>	Wireless Solutions Kits make it easy to monitor remote and mobile assets, collect and act on data, and solve specific applications. No programming is required. Simply plug in the box, bind the nodes, install the sensors and nodes, and begin collecting data.	96






# Wireless Sensors

Wireless sensors, lighting, and indicators allow you to remotely monitor and diagnose systems quickly, which reduces downtime, increases productivity, and provides data to optimize your operation. They are easy to install and setup, eliminate expensive cable runs, and can integrate machines that were not previously network capable.









Series	Description	Special Consideration	Page # or Web
 <p>QM42 Vibration &amp; Temperature Series</p>	The QM42VT Vibration and Temperature Sensor makes it easy to monitor a machine's health. It measures multiple vibration characteristics and temperature so that problems can be detected before they become too severe and cause additional damage or result in unplanned downtime. Paired with a Banner wireless Node, it can provide local indication, wirelessly send the signal to a central location, and send the vibration and temperature data to the Gateway for collection and trending.		
 <p>Temperature &amp; Humidity Sensor Series</p>	Sure Cross® Temperature and Humidity Sensors work in a variety of environments to provide temperature and humidity measurements. Used with Sure Cross Wireless Radios, these sensors make it easy to monitor environmental conditions without costly wiring runs to monitoring points.		
 <p>Wireless Ultrasonic Sensors – K50U Series</p>	The K50U ultrasonic sensor makes it easy to monitor mobile and remotely located tanks and totes		
 <p>Q45 Nodes for Predictive Maintenance</p>	Sure Cross® Q45 1-Wire Serial Nodes are designed to work with Banner's 1-Wire Serial Sensors. Their compact size, integrated lithium batteries, and variety of compatible sensors make remote monitoring easy.		95
 <p>Q45 Switches and Push Buttons</p>	Sure Cross® Q45 Switches and Push Buttons are designed to accept remote dry contact, NAMUR, and discrete non-contact switch inputs for use in many factory automation, remote monitoring, and IIoT applications.		94
 <p>Q45 Photoelectric Wireless Sensors</p>	Sure Cross® Q45 Photoelectric Sensors combine a sensor, wireless node, and an internal battery in a single device, making it easy to solve challenging factory applications or add sensing to existing industrial systems.		94
 <p>Wireless M-GAGE Node</p>	<i>FlexPower</i> Node with internal battery designed for vehicle detection.		
 <p>Wireless Ultrasonic Sensor Node</p>	Wireless <i>FlexPower</i> Node with internal battery designed for object or vehicle detection		
 <p>GPS Receiver</p>	Low power consumption, ability to withstand harsh environments, flexible power supply requirements and Modbus RTU communications makes this module ideal for the industrial market.		
 <p>Wireless Q120 Pendants</p>	An autonomous wireless Node that enables two-way communication between an operator and up to six remote and/or mobile devices.		

**KEY**

Vibration
Temp
Ultrasonic

# Selection Guide | Wireless Lighting and Indicators

Series	Description	Page # or Web
 <p data-bbox="228 380 378 401">TL70 Tower Lights</p>	<p data-bbox="430 359 1349 422">Wireless TL70 Modular Tower Light is bigger, brighter and can be ordered as modular segments or pre-assembled. TL70 Tower Lights combine Banner's popular Tower Light family with its reliable, field proven, Sure Cross wireless architecture.</p>	
 <p data-bbox="228 516 345 558">TL70 Wireless Segment</p>	<p data-bbox="430 516 1320 558">The TL70 wireless communication segment makes it easy to add network connectivity to any TL70 Tower Light with a standard base.</p>	
 <p data-bbox="228 657 362 720">70 mm Wireless Touch Buttons – K70 Series</p>	<p data-bbox="430 667 1317 709">The EZ-LIGHT K70 touch button is a large, easy to activate solid state switch and high visibility indicator. Touch buttons in this series are ideal for use in pick-to-light, call button and general industrial applications.</p>	
 <p data-bbox="228 804 386 867">70 mm Wireless Domed Indicators – K70 Series</p>	<p data-bbox="430 814 1344 856">Wireless K70 Indicators are bright, multicolored indicators with a 70 mm dome and offer increased communication possibilities and greater versatility in deployment.</p>	

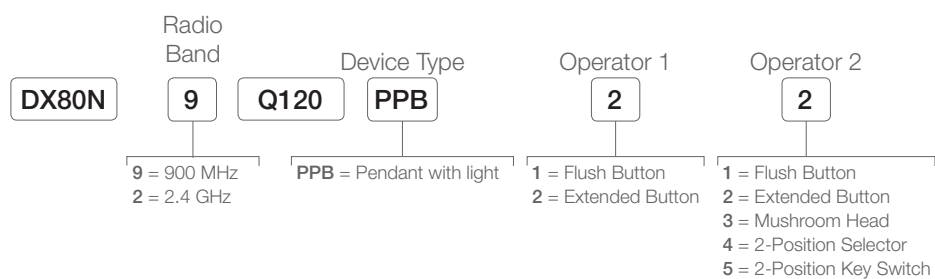


# Q120PPB Pendant

## Interface Device

The Wireless Q120PPB Pendant station is a compact, industrial, battery-powered operator interface device that can be used to wirelessly transmit two discrete inputs to a wireless controller/gateway. These inputs provide for remote control and local LED indication. All configuration is done through internal DIP switches or through the Banner DX80 Configuration Tool.

- Powerful operator interface device to deliver factory automation and IIoT solutions for many applications including but not limited to:
  - Call for parts, service, or pallet pickup
  - Remote door control
  - AGV control
  - Motor jog control
  - Perimeter gate control, etc.
- Easy-to-use rugged device that can be handheld or mounted to equipment
- Two independent normally open operators for monitoring or control
- Local LED indication can be linked to operator status or to other wireless inputs within the network
- Battery powered for “peel and stick” functionality with a two-year battery life capability
- Eliminate control wires—The Sure Cross wireless system is a radio frequency network with integrated I/O that removes the need for power and control wires
- Reduce complexity—Machine or process reconfiguration made easier; great for retrofit applications
- Deploy easily—Simplify installation on existing equipment enables deployment in remote and hard-to-access locations where implementing a wired solution would be difficult, impractical, or not cost-effective



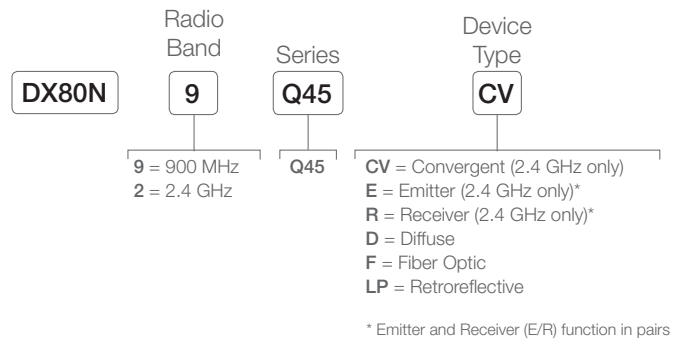




## Q45 Photoelectric Sensors

Q45 Photoelectric Sensors combine a sensor, wireless node, and an internal battery to make it easy to solve challenging factory applications or add sensing to existing industrial systems.

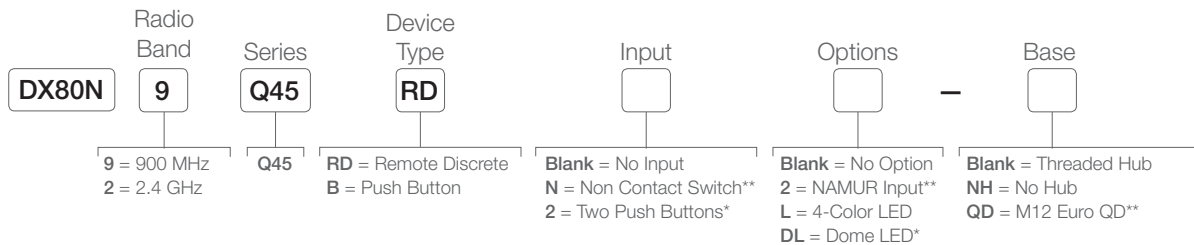
- Truly self-contained with no need for cables, cord sets, or external power
- Up to 1.5 years of battery life
- Designed for fast installation and ease of changeovers



## Q45 Switches and Push Buttons

Sure Cross® Q45 Switches and Push Buttons are designed to accept remote dry contact, NAMUR, and discrete non-contact switch inputs for use in many factory automation, remote monitoring, and IIoT applications.

- Remote discrete models are designed to interface with isolated dry contact inputs or NAMUR inductive proximity sensors.
- Button and light models have independently controlled push button inputs and a multi-color LED indicator light.
- Remote discrete non-contact switch models use a reed switch and a magnet to sense the position of mechanical devices such as doors, levers, valves, and other actuators.



\* Only available with B model  
 \*\* Only available with RD model

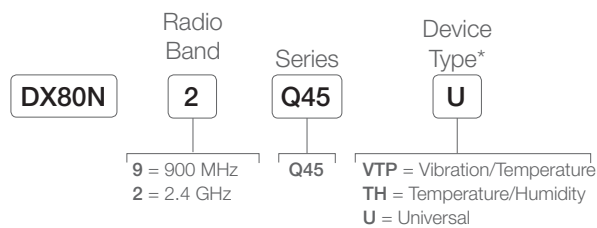
# Q45 Nodes for Predictive Maintenance

To save on installation time, Q45 1-wire serial nodes are pre-configured to work with Banner 1-wire serial sensors. The compact size, integrated lithium batteries, and a variety of compatible sensors make remote monitoring easy.

- The Q45VTP is designed to pair with the QM42VT1 vibration and temperature sensor. Vibration characteristics and sample intervals can be set using DIP switches.
- The Q45TH connects directly to the M12FTH4Q temperature and humidity sensor. Sample rates can be set using DIP switches.
- The Q45U is a universal 1-wire serial node that reads any Banner 1-wire serial sensor and determines an efficient power setting.



## Select Your Node



\* Sensor units must be ordered separately

## Select Your Sensor



# Q45 All-in-One Sensor

- Vibration or Tank Level sensor and node in one compact package
- Uses a 1-wire serial interface
- Easy-to-order
- Easy-to-deploy
- DIP switch configurable for vibration characteristics and sample intervals
- Dual-axis vibration sensing



## Vibration: Sensor and Node

Models	Description
DX80N9Q45VA	All-in-one Vibration sensor – 900 MHz
DX80N2Q45VA	All-in-one Vibration sensor – 2.4 GHz

## Ultrasonic: Sensor and Node

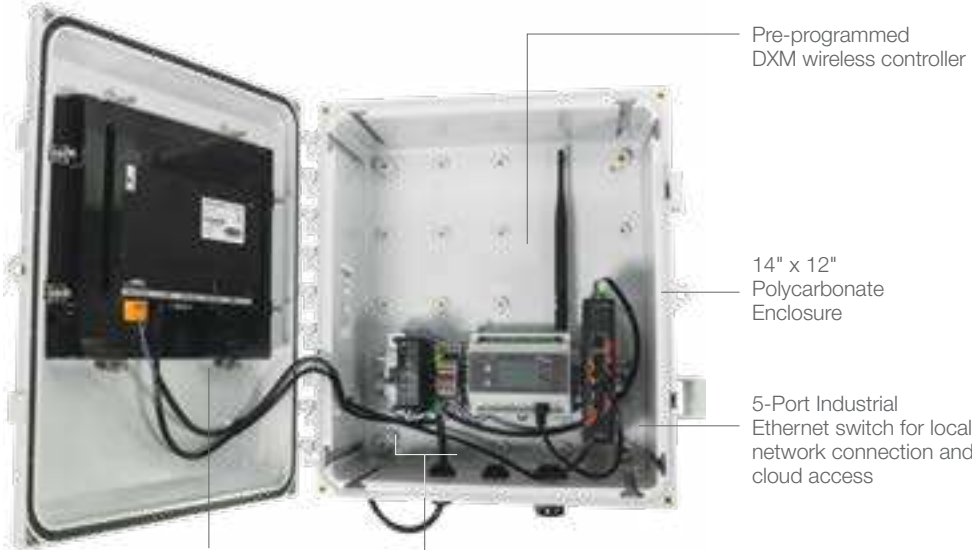
Models	Range	Description
DX80N9Q45UAC	900 MHz	Q45 Node with Integrated Ultrasonic Sensor
DX80N2Q45UAC	2.4 GHz	Q45 Node with Integrated Ultrasonic Sensor

# Wireless Solutions Kit

## Tank Level or Vibration

Wireless Solutions Kits are fully integrated and easy-to-use solutions for monitoring assets and solving specific applications. They are designed to make it easy for users of any experience level to setup a wireless network, collect remote data, and create visualization tools, warnings, and alarms.

- No programming is required. Plug in the box, bind the nodes through the HMI screen, install the sensors and nodes, and start collecting data
- Includes pre-programmed DXM100 wireless controller, pre-programmed 10.1 inch touchscreen HMI, and 5-port industrial Ethernet switch
- HMI provides graphical displays of collected data, baselines, thresholds, warnings, and alarms
- Access raw data right on the HMI or via the cloud from any network accessible location
- View up to 7 days of data history on HMI screen and archive over 30 days of logged data in CSV files
- Increase productivity by using warnings and alarms to quickly identify and resolve potential issues



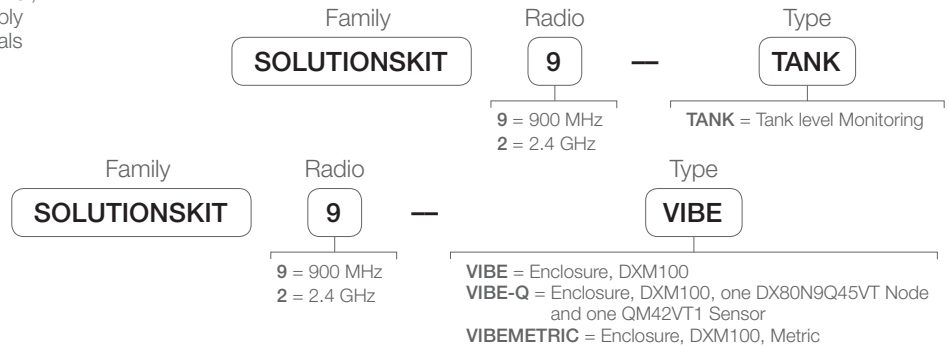
Pre-programmed 10.1" HMI with LAN connection to DXM

Circuit breaker, power supply and terminals

Pre-programmed DXM wireless controller

14" x 12" Polycarbonate Enclosure

5-Port Industrial Ethernet switch for local network connection and cloud access



# Solutions for Leading Edge Detection



**BANNER**<sup>®</sup>

# What is Leading Edge Detection?

## What is Leading Edge Detection?

On equipment that moves a product, container, or package, sensors are used to detect the movement or presence of these items to make critical decisions. Specifically, these applications rely on detecting the leading edge of the item as quickly and as accurately as possible.

## Challenges of Leading Edge Detection

### *Types of Containers/Packaging*

Trends in packaging have migrated from boxes to more challenging targets. Polybags, Blister packs, envelopes, totes, and tubes are all commonly transported on conveyor lines and can have irregular shapes. As a result, sensing solutions need to be adapted to reliably detect a product.

### *Types of Conveyors/Equipment*

There are many different types of conveyors and machines used to move goods. Some machines can use certain types of sensors while others may not.





Single-Point  
Leading Edge Detection



Small and Flat Object  
Leading Edge Detection



Wide-Beam  
Leading Edge Detection



Through the Roller  
Leading Edge Detection



Robust Array  
Leading Edge Detection

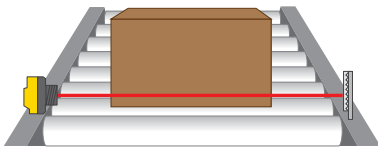




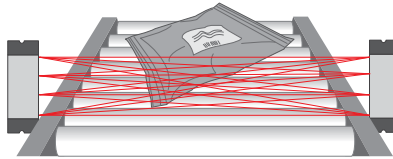
# Choosing a Banner Sensor

Choosing the right sensor can reduce errors caused by product jamming, overlapping, side-by-side, and irregular shaped packages.

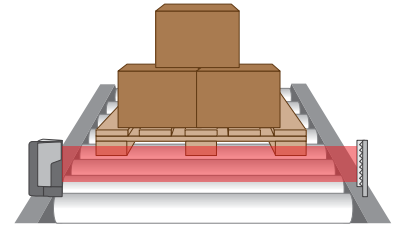
Single-Point  
Leading Edge Detection



Small and Flat Object  
Leading Edge Detection



Wide-Beam  
Leading Edge Detection



QS18 or Q20



LX



Q76E

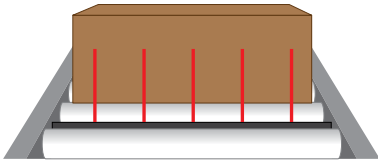


Cost-effective yet powerful, these compact sensors detect boxes, totes, and many other objects.

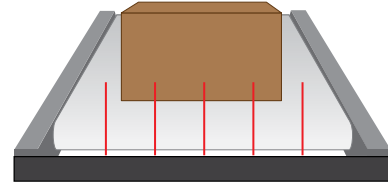
Short response time and large detection area creates an accurate solution for very small or flat objects.

Wide sensing beam detects items like pallets, polybags, or other irregularly shaped objects.

Through the Roller  
Leading Edge Detection



Robust Array  
Leading Edge Detection



TTR



SAB



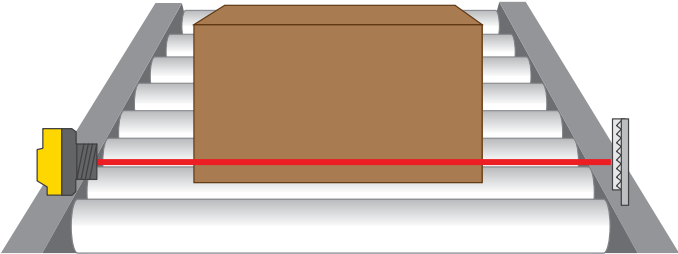
An improved solution for roller conveyors, this sensor mounts easily between rollers, detecting a variety of objects.

Heavy-duty sensor bar suitable for tough environments such as sorter chutes and roller conveyors.



# Single-Point Leading Edge Detection

- Lowest cost solution
- Sufficient for many targets
- Used on conveyors with rails on the sides
- Robust sensing solution that only requires power on one side of the conveyor
- Polarization assures reliable detection of highly reflective objects



## Polarized Retroreflective Sensors

- Polarization assures reliable detection of highly reflective objects
- Fast response speed, less than 1 ms, for excellent sensing repeatability
- Features bright LED operating status indicators visible from 360°



### QS18 All-Purpose Photoelectric Sensor

- Universal housing design with 18 mm threaded lens makes an ideal replacement for hundreds of other sensor styles

Models	Sensing Mode	Sensing Range	Connector	Output
QS18VN6LPQ8	630 nm Visible Red	3.5 m (12 ft)	4-pin Euro M12 integral QD	NPN
QS18VP6LPQ8				PNP

\* Integral QD connector listed. Cabled and other models available on our website.



### Q20 Industry Standard Global Housing

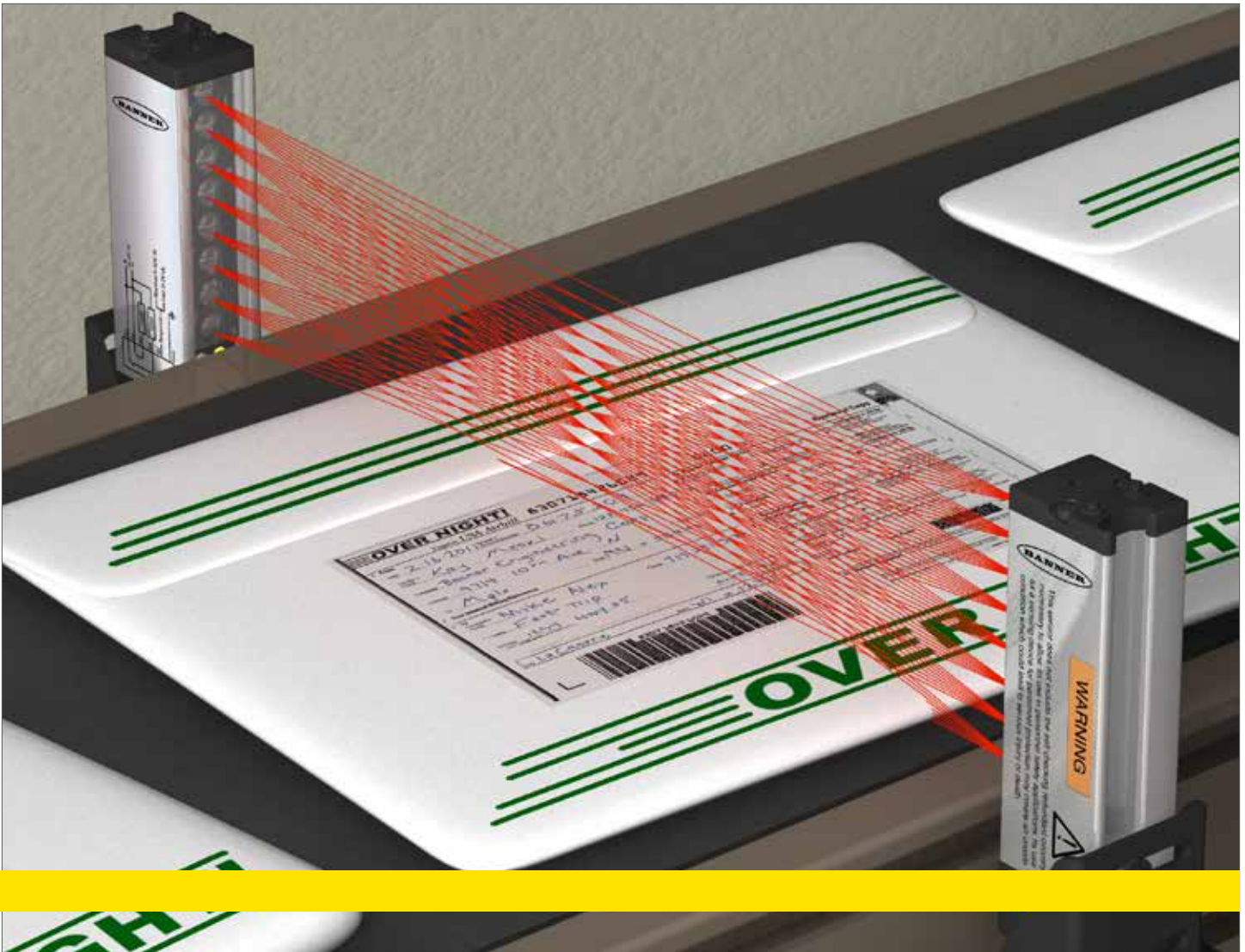
- Rectangular Housing for versatile mounting with M3 threaded inserts with 25.4 mm hole spacing

Models	Sensing Mode	Sensing Range	Connector	Output
Q20PLPQ7	645 nm Visible Red	4 m (13 ft) (specified using reflector BRT-84)	4-pin Pico M12 integral QD	PNP
Q20NLPQ7				NPN

\* Integral QD connector listed. Cabled and other models available on our website.

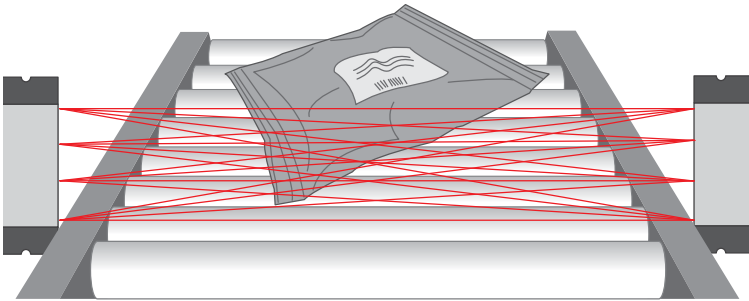
## Specifications

	QS18	Q20
Response Speed	850 $\mu$ s	850 $\mu$ s
Environmental Rating	IEC IP67	IEC IP67
Construction	ABS Housing	ABS Housing



# Small or Flat Leading Edge Detection

- Crosshatch beam pattern detects very small or flat packages
- Durable housing design resists damage
- High-speed, response time as fast as 0.8 milliseconds





## LX Small and Flat Object Detection Sensor

- Large detection area to provide consistent detection of packages where the leading edge varies
- Generates a cross hatched beam pattern that can detect an object as thin as 1 mm, depending on the width
- Response speeds as fast as 0.8 ms allows automated systems to operate at higher line speeds resulting in increased throughput

Models	Response Time	Sensing Array Length	Output Type	Cable*
LX3E Emitter LX3R Receiver	0.8 ms ON-time 6 ms OFF-time (5 ms OFF-delay)	67 mm (2.6 in)	Bipolar NPN/PNP	2 m (6.5 ft) 5- wire Integral cable
LX6E Emitter LX6R Receiver	1.6 ms ON-time 7 ms OFF-time (5 ms OFF-delay)	143 mm (5.6 in)		
LX9E Emitter LX9R Receiver	2.4 ms ON-time 7.5 ms OFF-time (5 ms OFF-delay)	218 mm (8.6 in)		
LX12E Emitter LX12R Receiver	3.2 ms ON-time 8.5 ms OFF-time (5 ms OFF-delay)	295 mm (11.6 in)		
LX15E Emitter LX15R Receiver	4.0 ms ON-time 9 ms OFF-time (5 ms OFF-delay)	371 mm (14.6 in)		
LX18E Emitter LX18R Receiver	4.8 ms ON-time 10 ms OFF-time (5 ms OFF-delay)	447 mm (17.6 in)		
LX21E Emitter LX21R Receiver	5.6 ms ON-time 11 ms OFF-time (5 ms OFF-delay)	523 mm (20.6 in)		
LX24E Emitter LX24R Receiver	6.4 ms ON-time 11.5 ms OFF-time (5 ms OFF-delay)	599 mm (23.6 in)		
LX27E Emitter LX27R Receiver	7.2 ms ON-time 12 ms OFF-time (5 ms OFF-delay)	686 mm (27.0 in)		
LX30E Emitter LX30R Receiver	8.0 ms ON-time 13 ms OFF-time (5 ms OFF-delay)	762 mm (30.0 in)		
LX33E Emitter LX33R Receiver	8.8 ms ON-time 14 ms OFF-time (5 ms OFF-delay)	838 mm (33.0 in)		
LX36E Emitter LX36R Receiver	9.6 ms ON-time 15 ms OFF-time (5 ms OFF-delay)	914 mm (35.9 in)		

\* Integral cable models are listed.

- To order the 5-pin M12/Euro-style 150 mm (6 in) cable model, add suffix "Q" to model number (for example, LX3EQ).
- Models with a quick disconnect require a mating cordset.

## Specifications

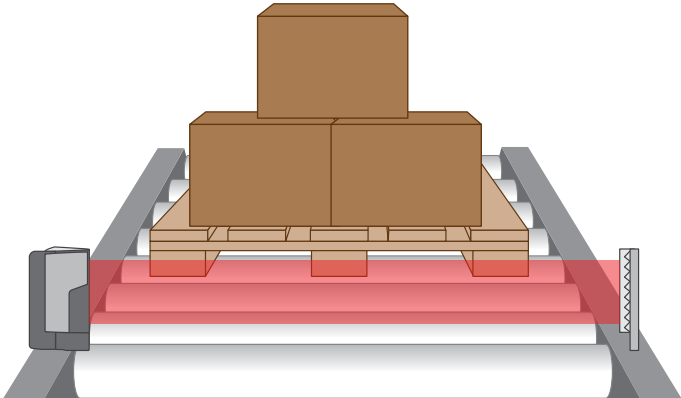
<b>Sensing Range</b>	Short-Range Models: 75 to 150 mm (3 in to 6 in) or 100 to 200 mm (4 in to 8 in); depending on mode Standard-Range Models: 150 mm to 600 mm (6 in to 24 in) or 300 mm to 2 m (1 ft to 6.5 ft); depending on mode
<b>Environmental Rating</b>	Meets IEC IP65
<b>Construction</b>	Aluminum housing, die cast zinc with black e-coat painted endcaps, acrylic lens window





# Wide-Beam Leading Edge Detection

- Detects irregular-shaped objects
- Retroreflective sensor, only requires wiring on one side





## Q76E Wide Beam Retroreflective Sensor

- Wide beam retroreflective sensor for reliable leading edge detection of irregular shaped objects or pallets
- Visible red beam for simple alignment and bright LEDs for visual indication
- Up to 4 meter range for mounting flexibility
- Two sensitivity levels for detection of challenging targets such as shrink wrapped pallets, small objects and film or perforated packaging
- Easy set-up, adjustment and LO/DO selectable via single push button
- 250 Hz switching frequency for high speed production lines
- IP67- and IP69-rated for washdown applications

Models	Range	Input	Output	Cable
Q76E-VP-ZLVC-Q5	0.4 mm to 4.0 m (1.3 to 13.1 ft)	10 to 30 V DC	Complementary PNP	200 mm (7.5 in) PUR cable with a 4-pin M12/ Euro-style male quick disconnect
Q76E-VP-ZLVC-Q8				Integral 4-pin M12/Euro-style male quick disconnect
Q76E-VP-ZLVC-2M				2 m (6.5 ft) unterminated 3-wire PVC cable
Q76E-VN-ZLVC-Q5			Complementary NPN	200 mm (7.5 in) PUR cable with a 4-pin M12/ Euro-style male quick disconnect
Q76E-VN-ZLVC-Q8				Integral 4-pin M12/Euro-style male quick disconnect
Q76E-VN-ZLVC-2M				2 m (6.5 ft) unterminated 3-wire PVC cable
Q76E-KP-ZLVC-Q5				

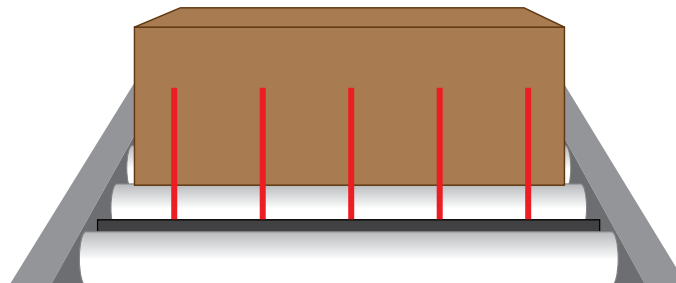
## Specifications

Range	4 m			
Response Time	2 ms			
Minimum Object Detection Size	Sensitivity Setting	Max. Range 100x100 Reflector	Max. Range 40x60 Reflector	Minimum Object Detection Size
	Standard	4.0 m	3.0 m	19 mm
	Increased	4.0 m	3.0 m	12 mm
	Increased with Fine Adjustment	4.0 m	3.0 m	8 mm
Environmental Rating	IEC IP67, IEC IP69			
Construction	PC-PBT Housing; PMMA Lens Cover			



## Through-the-Roller Leading Edge Detection

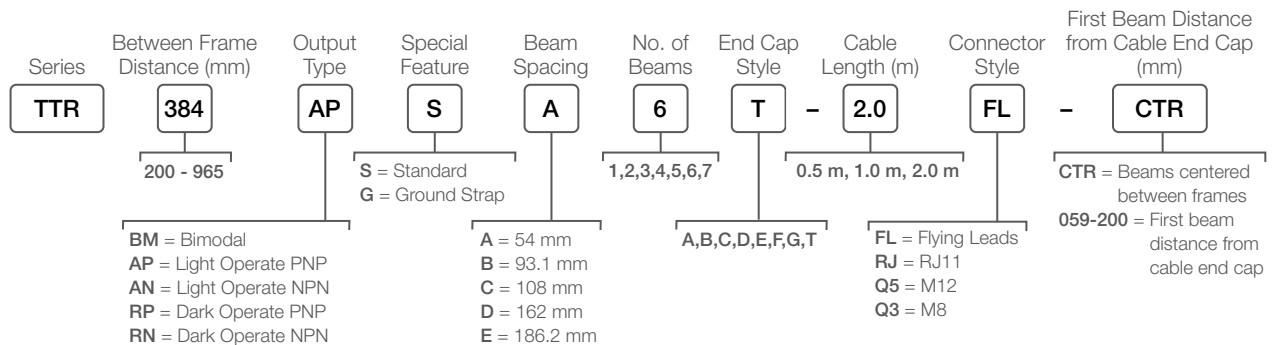
- Designed for roller conveyors without sides for mounting sensors
- Detects irregularly shaped items
- Large items can knock sensors off sides of conveyors





## TTR Through The Roller Sensor

- Reliable leading-edge detection of letters, thin packages, poly bags, totes, boxes or other product on roller conveyors
- Mounts between conveyor roller gap to standard hex or round side rail holes with no extra hardware required or on the T-Slot with customer supplied bracket and hardware
- Spring loaded end caps reduce installation and alignment time for reduced labor costs
- Built to order with specified length and beam spacing: 200 to 964 mm (8 to 38 inches) with 2 to 7 sensors for maximum flexibility
- Robust aluminum housing, ambient light and ESD resistance for enhanced durability



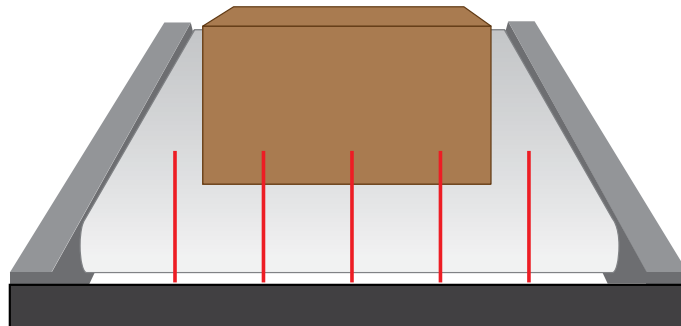
## Specifications

Range	120 mm
Output Types	NPN, PNP, Bimodal
Number of Beams	2 minimum - 7 maximum
Maximum Length	965 Standard
Response Time	1 µs ON/OFF
Minimum Object Detection Size	54 mm Beam Spacing - 2" x 2" 93.1 mm Beam Spacing 4" x 4" 162 mm Beam Spacing 6" x 6"
Environmental Rating	IEC IP50
Construction	Aluminum Housing



## Robust Array Leading Edge Detection

- Heavy-duty design protects from impact
- Ideal for detecting items moving down a chute
- Diffuse and Retroreflective modes available to accommodate a variety of applications
- Longer sensing range than TTR





## SAB Sensor Array Bar

- Customizable Sensor Array Bar — Different lengths and number of sensors
- Robust aluminum housing protects array bars from challenging environments
- One M12 connector powers the entire array bar and consolidates all outputs into one
- Polarized retroreflective, long-range diffuse, or standard diffuse array bars are available
- IEC rating of IP50
- Solid-state bipolar outputs (NPN and PNP)

Models	Beams	Supply Current	Sensing Range	Sensing Mode	Output
SAB-497RB1LP6-Q5E	6	150 mA	1 m (39 in) when using a BRT-THG-2 reflector tape as a target 3 m (118 in) when using 5 side-by-side BRT-92x92C reflectors or 6 side-by-side BRT-77x77C reflectors as targets	Polarized Retroreflective, Visible Red 624 nm	Dark Operate, Bipolar
SAB-497AB1LP6-Q5E	6	150 mA			Light Operate, Bipolar
SAB-998RB1LP13-Q5E	13	150 mA			Dark Operate, Bipolar
SAB-484RB1LP10-Q5E	10	150 mA			Dark Operate, Bipolar
SAB-497RB1DS6-Q5E	6	150 mA	200 mm (8 in) when using a 90% white card as a target 762 mm (30 in) when using a 90% white card as a target	Diffuse, Infrared, 940 nm	Dark Operate, Bipolar
SAB-497AB1DS6-Q5E	6	150 mA			Light Operate, Bipolar
SAB-998AB1DXL13-Q5E	13	325 mA			Light Operate, Bipolar

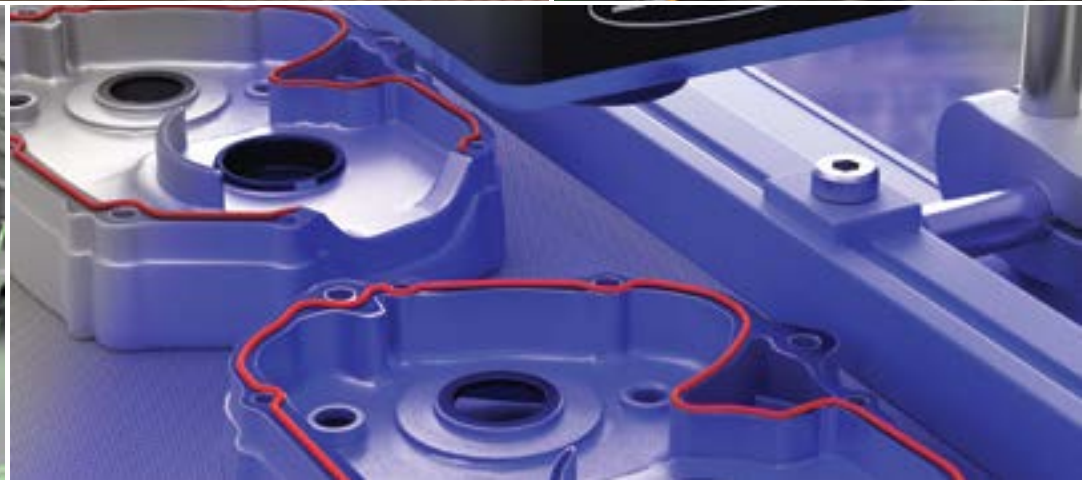
## Specifications

	Polarized Retro	Diffuse
Range	3 m	762 mm
Response Time	1.5 ms ON/OFF	3 ms ON/OFF
Array Length	135 mm (5.3") minimum, 1219 mm (48") maximum	
Number of Beams	2 minimum, 18 maximum	
Beam Spacing	44.4 mm (1.75") minimum	
Environmental Rating	IEC IP50	
Construction	Black Anodized Aluminum Housing	





# Vision Lighting



# Why Banner Vision Lighting

With over ten years of lighting experience Banner is been committed to developing new and innovative solutions, delivering products of the highest quality, fulfilling the needs of each customer, and operating with honesty and integrity. Banner's expanding offering of vision lights help you:



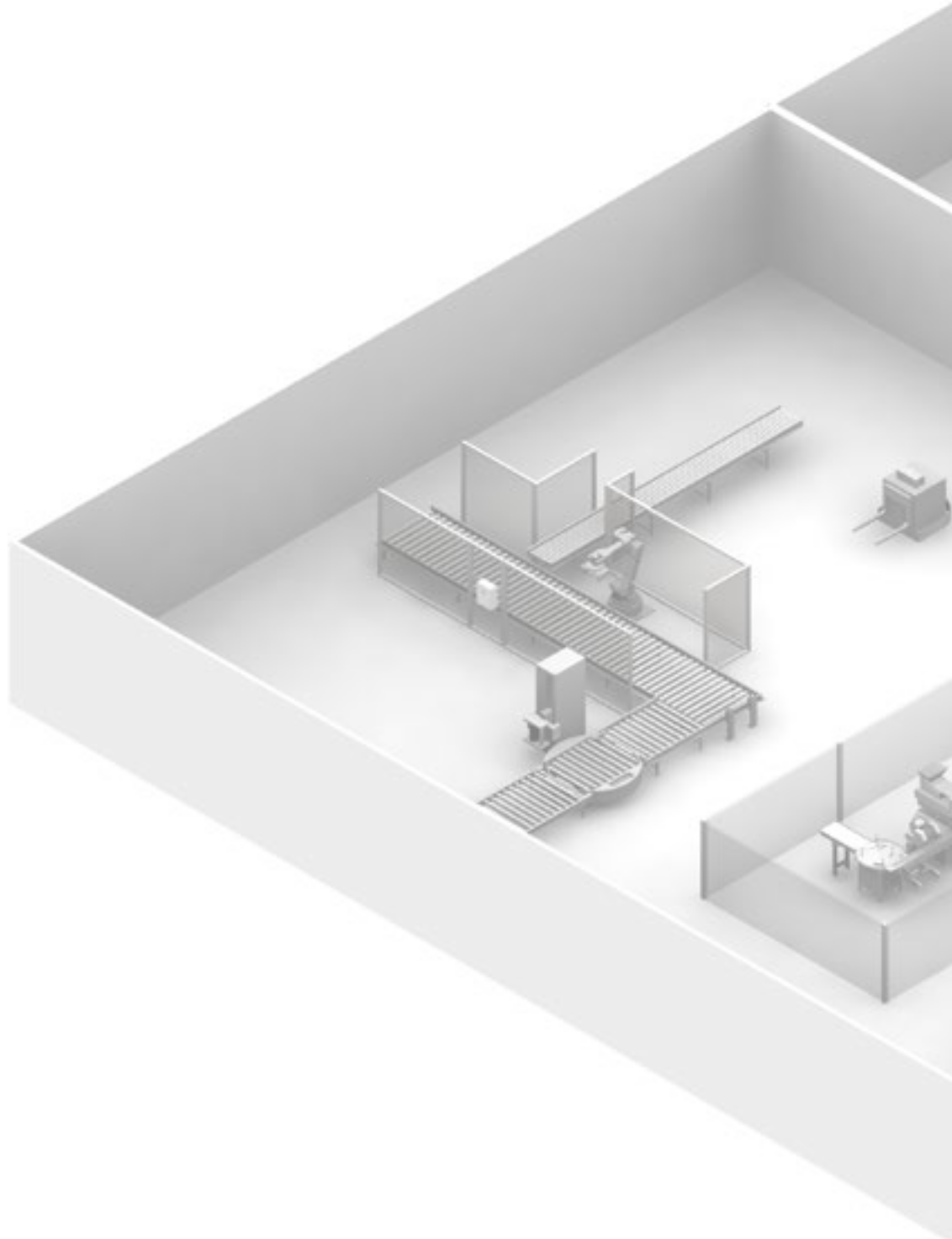
Reduce Labor Costs

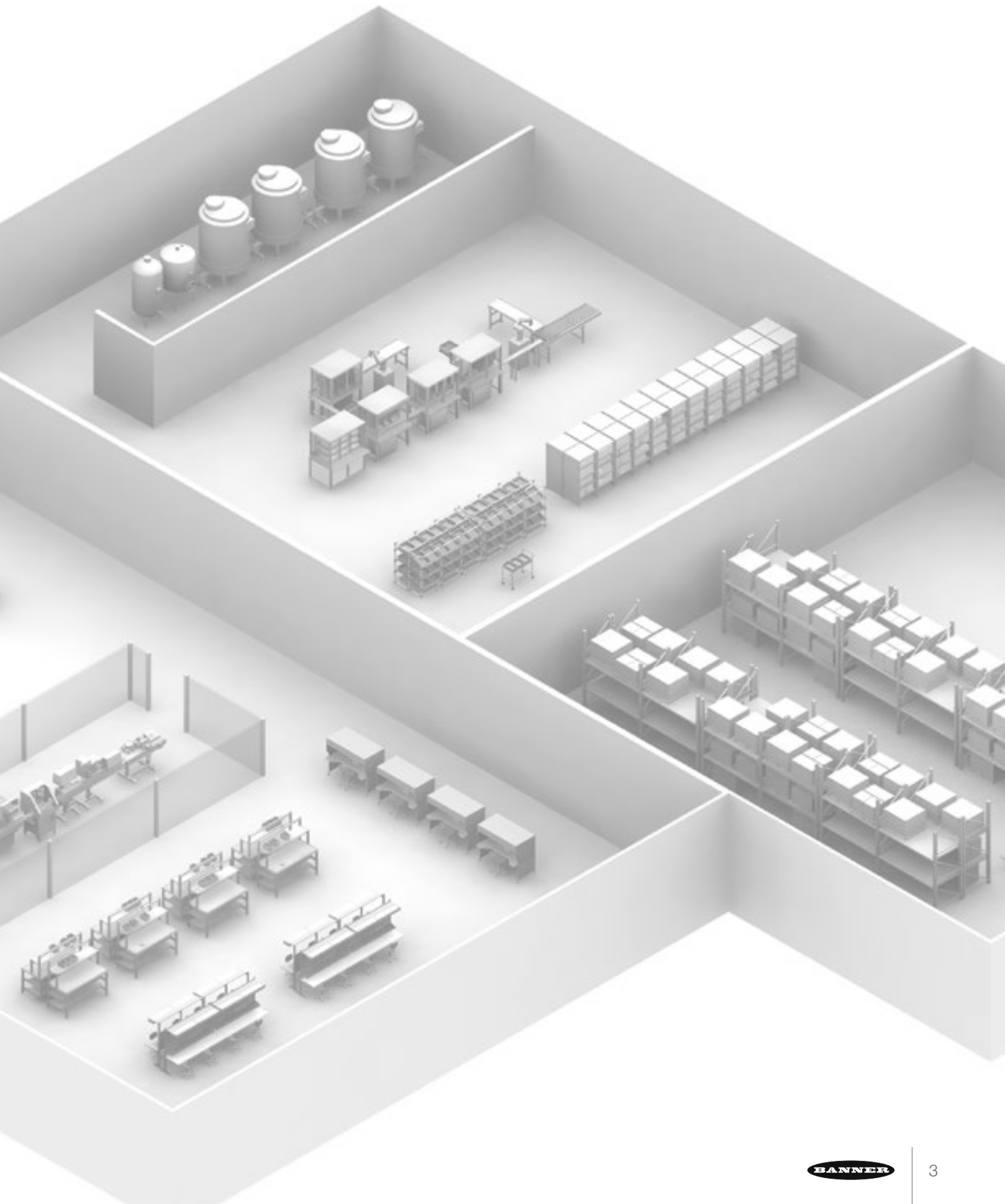


Improve Accuracy and Quality



Increase Production Rate





# Key Tasks of Vision Lights

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## Illumination Intensity



Machine vision systems are used as quality control to ensure critical inspection and measurement. They evaluate the image of the object—not the object itself—to get the correct lighting arrangement from the start. To optimize image quality, a dedicated light source should be used in any vision application. Dedicated lighting optimizes contrast between the target object or feature and its background.

## Repeatability



LED illumination has become the universal standard for machine vision. It is reliable, requires minimal maintenance, is easy to assemble and comes in a variety of colors, or wavelengths, such as red, blue, green, IR and UV.

In addition to identifying the correct type of illumination, ensuring that the light is consistent for every single measurement is critical in ensuring repeatable measurements.

## Stability



Factors affecting consistency of illumination:

- Age of light
- Variations in lighting and camera exposure
- Temperature of the light
- Variations in drive to the light
- Ambient light
- Timing of pulsed lighting

# Optimizing Image Quality

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To optimize image quality, a dedicated light source should be used in any vision application. Dedicated lighting:

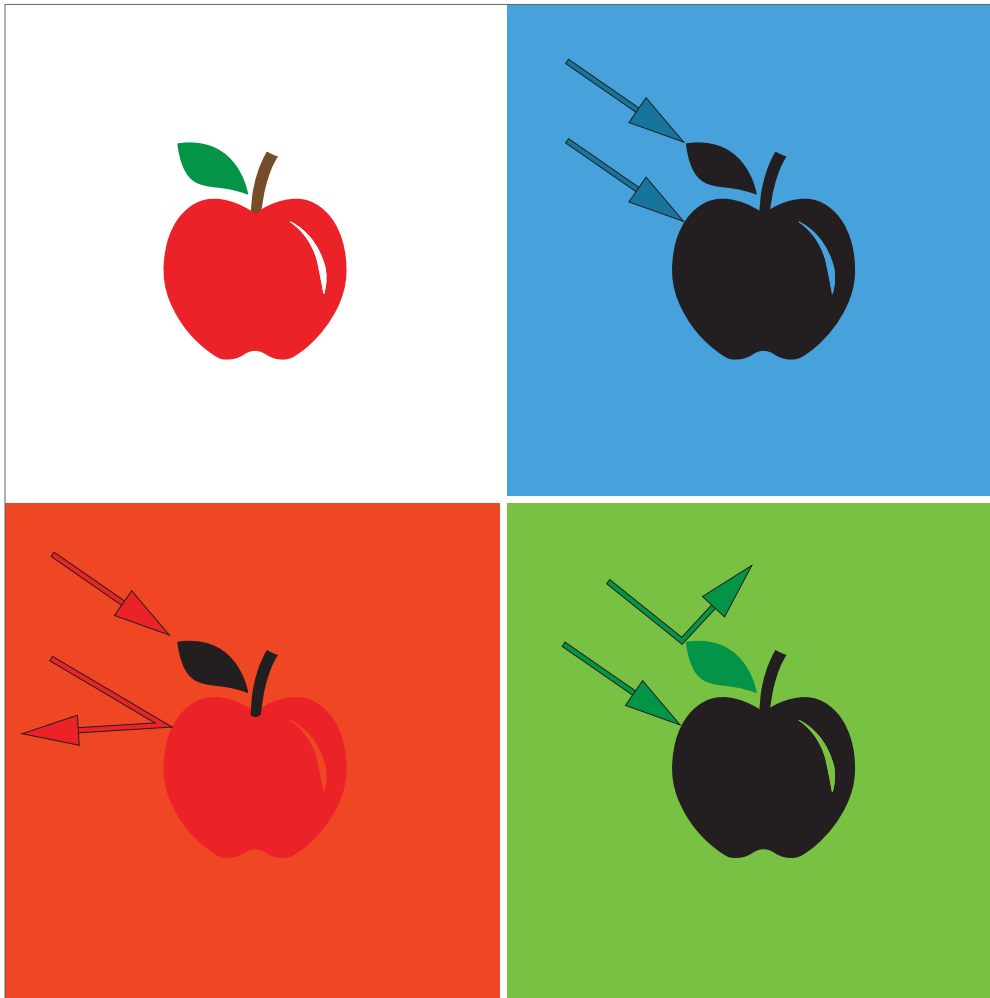
- Optimizes contrast between the target object or feature and its background,
- Provides uniform lighting conditions that allow image capture to be unaffected by ambient lighting in the factory environment, and
- Simplifies image analysis by creating high contrast between the “good” and the “bad” feature of interest



# Choosing the Right Color

In addition to choosing the right lighting technique, different wavelengths of light can also be used to create additional contrast, draw out features of interest, or reduce the visibility of insignificant features.

in blue light, the apple and the leaves appear black



in red light, the apple appears red because it reflects the light. The leaves however appear black.

in green light, the apple appears black because no red light is reflecting on it, but the leaves now look green..

## Infrared (IR) Light

Infrared (IR) light can be used to hide insignificant features by reducing the contrast of certain objects. For example, some types of ink that appear dark in the visible spectrum reflect large amounts of IR light. In these cases, ink may disappear in a grayscale image—an effect that can be used to hide certain insignificant features.

## Ultraviolet (UV) Light

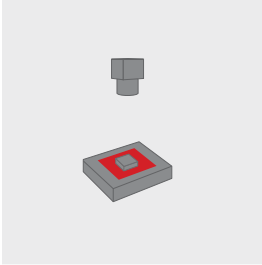
Ultraviolet (UV) light can be used to draw out features of interest when there is very little contrast from the background, such as beads of clear adhesive on a part. Shining UV light on the adhesive may create a glowing effect (fluorescence) that makes the adhesive stand out clearly from the background.



Lighting Techniques

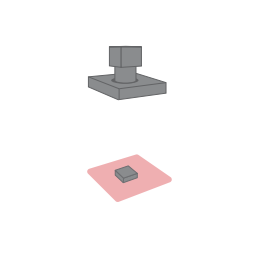
What the Camera Sees

Description



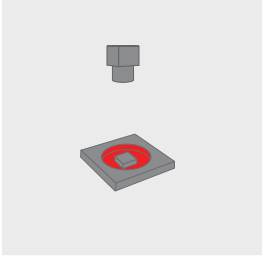
Backlights

The part being inspected is placed between the camera and a bright, even light source. The result creates a silhouette of the target which is useful in edge detection, part presence and measurement applications.



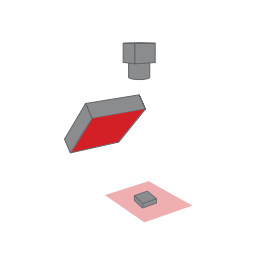
Ring Lights

A ring light is affixed to the camera and both items can be mounted as one piece for convenience. This setup is good for relatively small parts or close up applications.



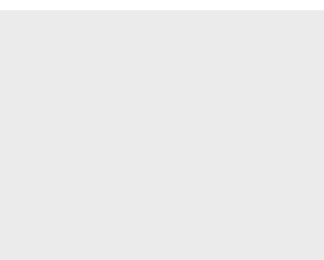
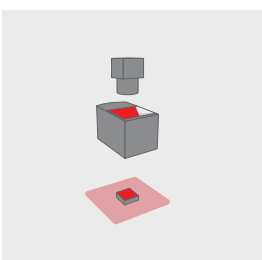
Low Angle Ring Lights

Also called a dark field illuminator, this specialty light has its LEDs mounted in a ring, pointing toward the part almost perpendicular to the camera's direction of view. Low Angle Ring lights create shadows and bright spots to detect changes in depth.



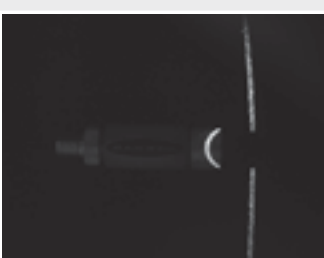
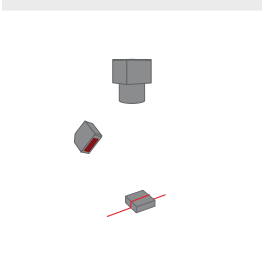
Directional Lights

Directional lights, in whatever style, create shadows to detect changes in depth, illuminate specific surface angles, and avoid glare of reflective surfaces when directed at an angle away from lens.



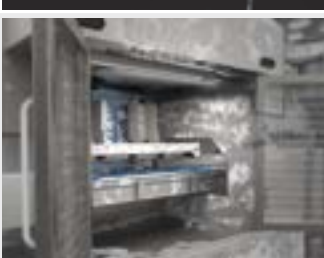
On-Axis Lights

On-axis, or coaxial, lights generates light that travels along the same axis as the camera's direction of view. The camera looks down from the top, through the On-Axis light, to the target part below. This technique can be used to eliminate shadows, inspect shiny objects or inspect for height changes.



Structured Lights

A laser line generator is an example of a structured lighting scheme. This technique uses a high quality, uniform laser line to infer the presence of a difficult to see target. As a three-dimensional part passes through the laser line's path, the image of the laser becomes distorted so the camera can detect the part.



Heavy Duty Lights

Our portfolio of heavy duty lights includes products suitable for use in washdown environments, hazardous locations, and high temperature applications. We offer a variety of waterproof devices that are resistant to common cleaning chemicals, as well as products that are resistant to cutting oils and fluids."



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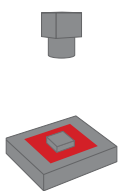
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## Backlights

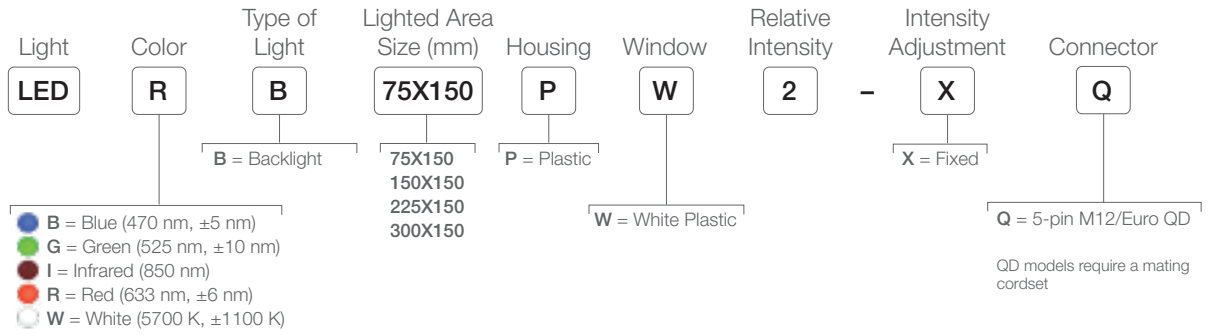
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- Creates silhouette for maximum contrast
- Determines the shape and size of target objects
- Offers a highly diffused surface and uniform brightness, with lower intensity than other lights
- Provides the most robust lighting for measuring and gauging
- Highlights through-holes in target objects



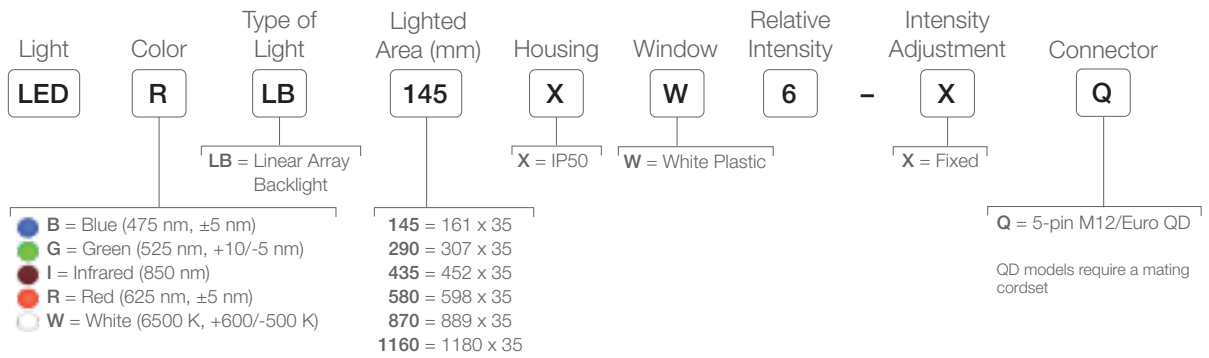
## Standard Backlights

Example Model Number: LEDRB75X150PW2-XQ



## Bar Backlights

Example Model Number: LEDRLB145XW6-XQ



### Supply Voltage

24 V DC

### White Lux @ 0 m

Standard: 45,000 Lux  
Bar: 52,000 Lux

### Construction

Standard: Black Valox™ housing; acrylic window  
Bar: Black anodized aluminum; acrylic window

### Operating Temperature

0 to +50 °C (+32 to +122 °F)

### Environmental Rating

Standard: IEC IP67  
Bar: IEC IP50

### Useful life

Standard:  
B50/L50 Lifetime > 100,000 hours  
(Infrared, Red)  
B50/L50 Lifetime > 90,000 hours  
(Blue, Green, White)

Bar:  
When operated within specifications, output will decrease less than 30% after 50,000 hours

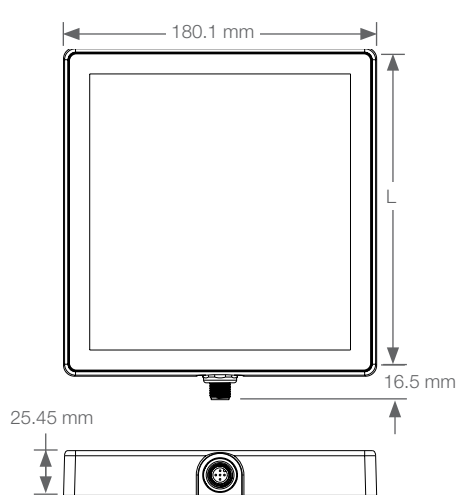
### Strobing/Control

Continuous or strobed operation

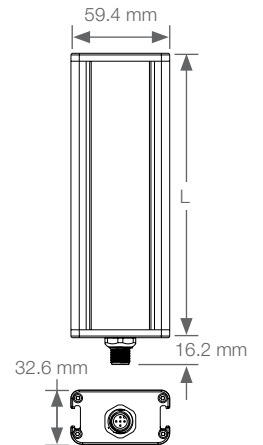
### Certifications



### Standard Models

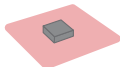
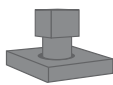
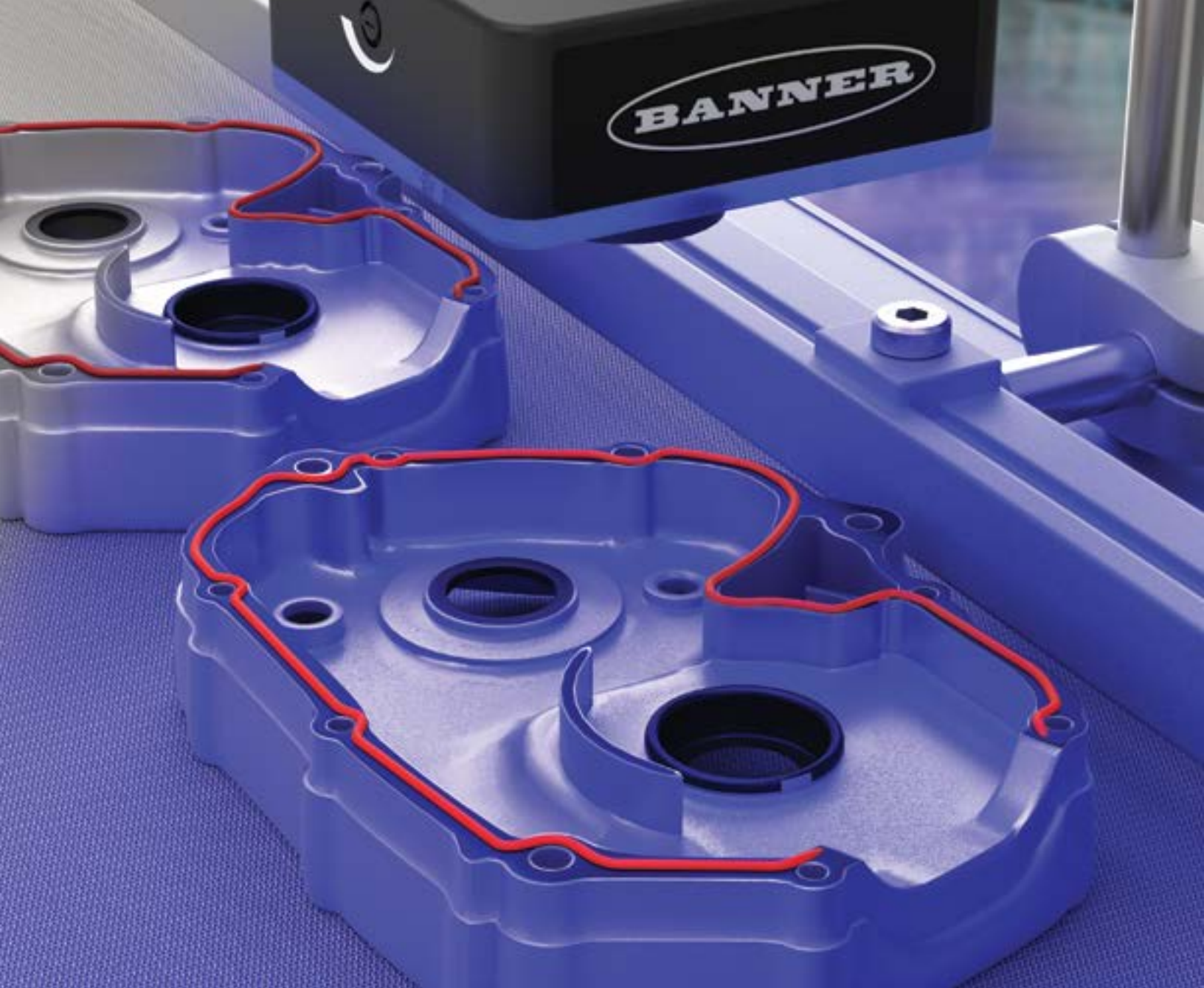


### Bar Models



Array Area	Length "L"
75 x 150 mm	105.1 mm
150 x 150 mm	188.9 mm
225 x 150 mm	272.7 mm
300 x 150 mm	356.6 mm

Array Length	Length "L"
145 mm	171 mm
290 mm	316.5 mm
435 mm	462 mm
580 mm	607.5 mm
870 mm	898.5 mm
1160 mm	1189.5 mm



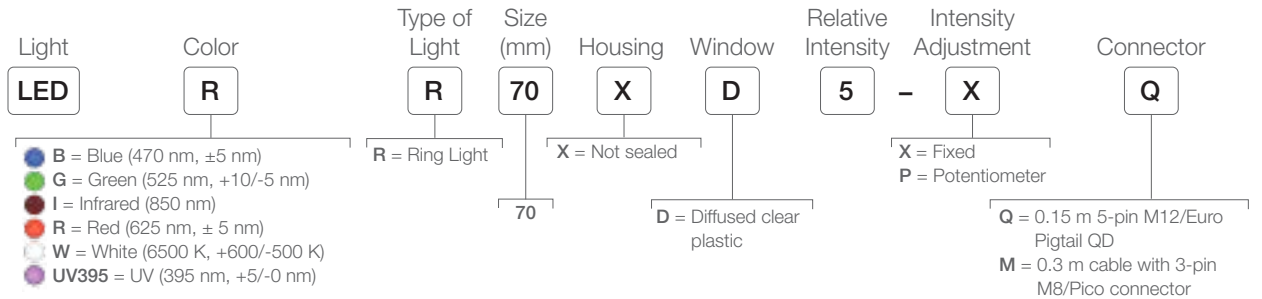
## Ring Lights

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- Easy integration between camera and light
- Brightly illuminates from a small form factor
- Mounts directly to the camera and centers the light on the image
- Brightly illuminates small objects
- Reduces shadows on images with protrusions

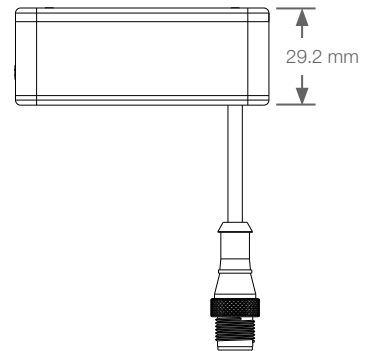
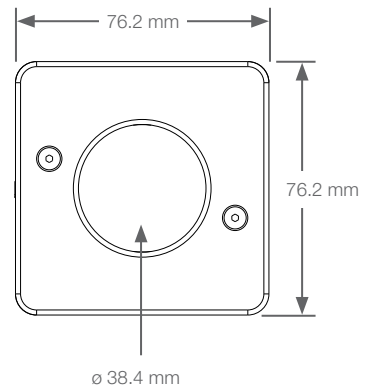
# Ring Lights

Example Model Number: LEDRR70XD5-XQ

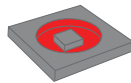
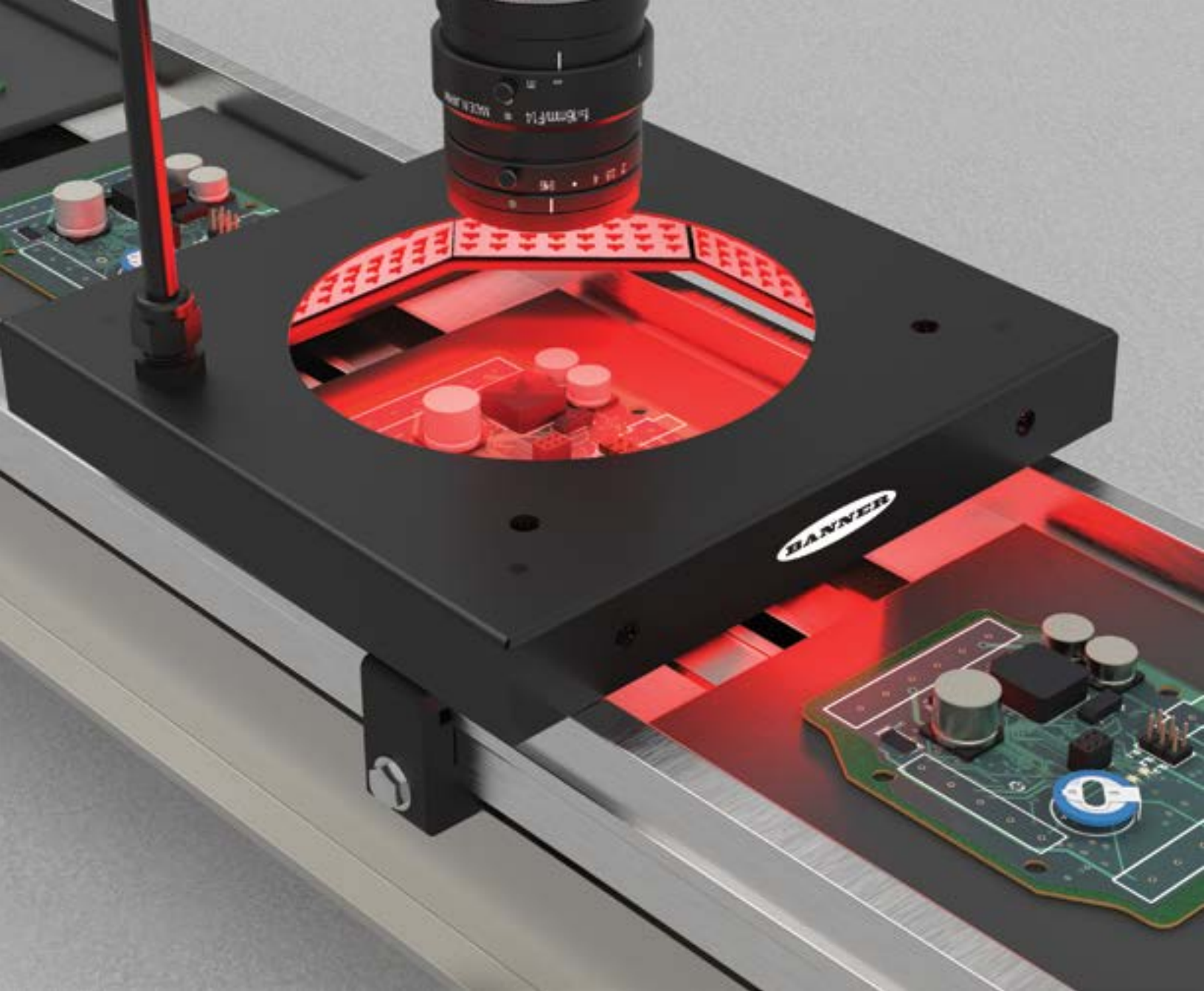


QD models require a mating cordset

Supply Voltage	24 V DC
White Lux @ 0.5 m	5,150 lux
Construction	Housing: Black anodized aluminum Window: Acrylic
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IP50
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	 







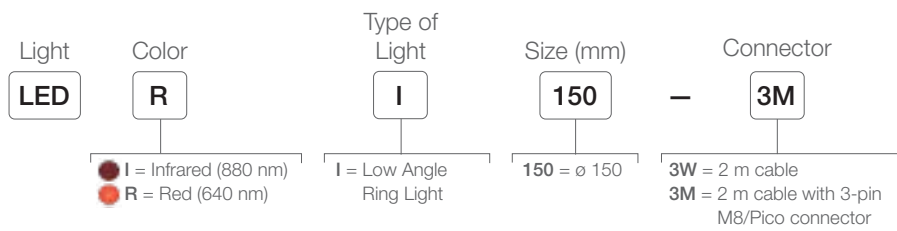
## Low-Angle Ring Lights

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- Illuminates from an angle nearly perpendicular to object
- Emphasizes surface irregularities such as dust, dents, scratches and other surface defects
- Highlights slight height differences such as etching, solder balls and embossing

# Low-Angle Ring Lights

Example Model Number: LEDRI1503M



Supply Voltage

24V DC

Construction

Housing:  
aluminum with black anodizing

Operating Temperature

0 to +50 °C (+32 to +122 °F)

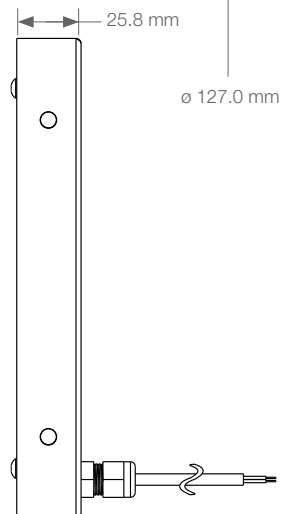
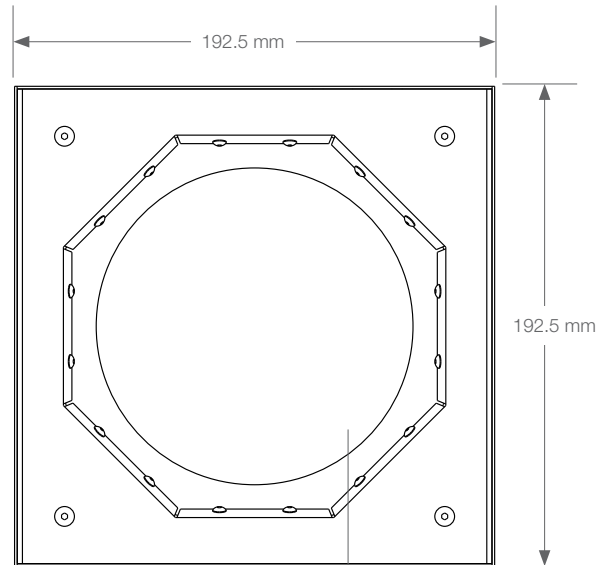
Useful life

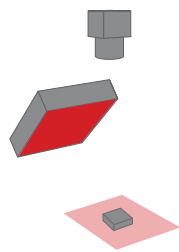
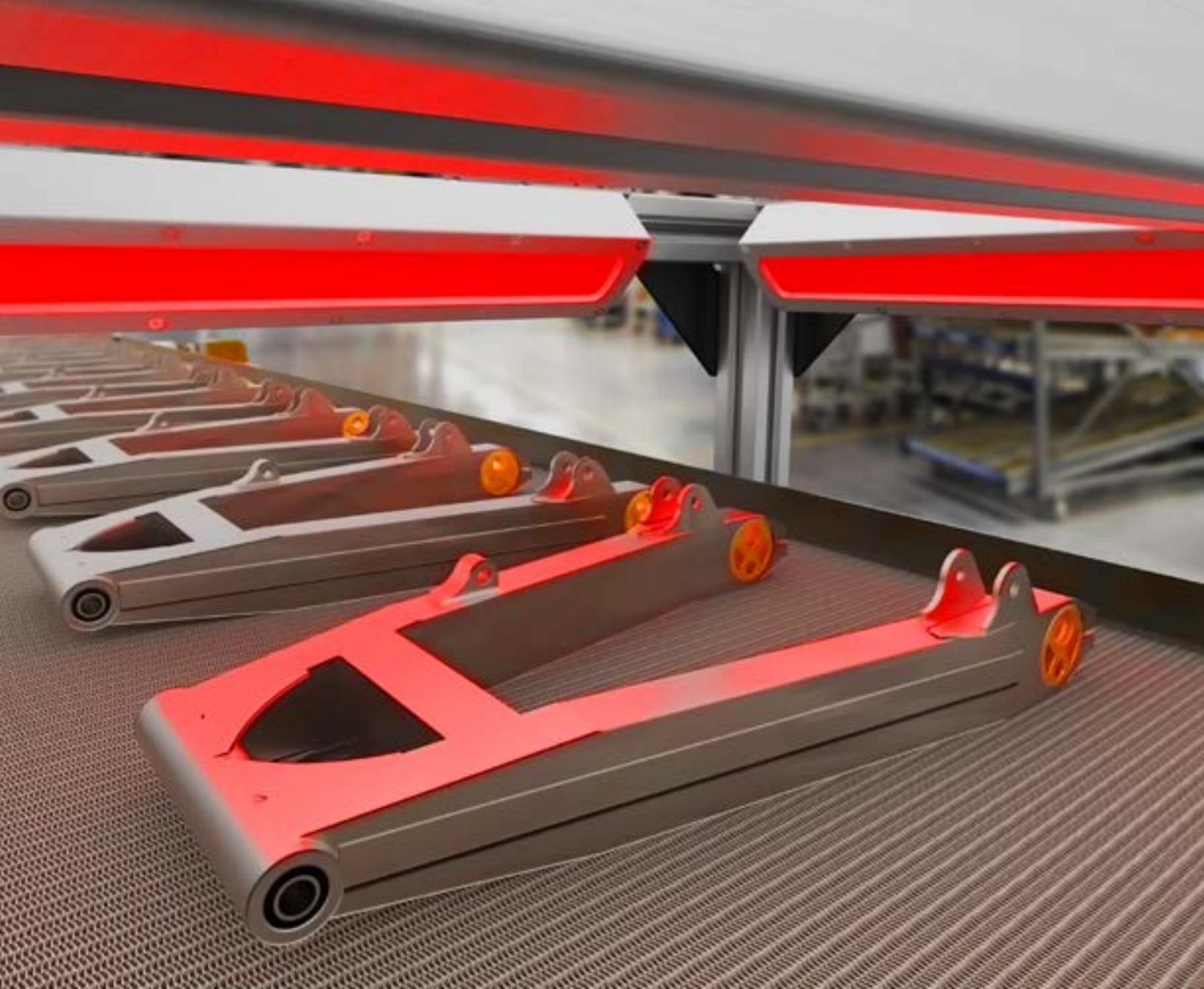
When operated within specifications, output will decrease less than 20% after 20,000 hours and less than 30% after 30,000 hours (based on continuous operation)

Strobing/Control

Continuous or strobed operation

Certifications





## Directional Lights

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- Provides even illumination in a concentrated area
- Creates shadows or glare to detect changes in depth, depending on mounting
- A wide variety of directional light styles are available including: Bar, Area, and Spot to fit the specific application needs
- High-intensity lighting for distances greater than 300 mm


# Bar Light

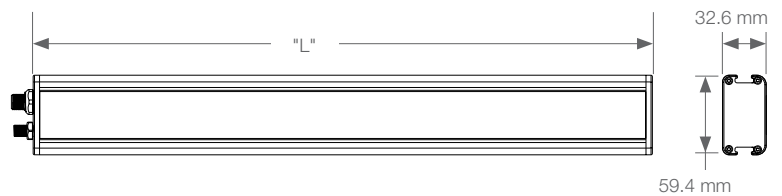
Example Model Number: LEDRLA290XD6-XQ



Light	Color	Type of Light	Lighted Length (mm)	Housing	Window	Relative Intensity	Intensity Adjustment	Connector
<b>LED</b>	<b>R</b>	<b>LA</b>	<b>290</b>	<b>X</b>	<b>D</b>	<b>6</b>	<b>- X</b>	<b>Q</b>
		LA = Linear Array	145** 290 435 580 870 1160	X = Not sealed	P = Plastic clear G = Glass clear D = Diffused clear plastic	X = Fixed PL = Pot & 0-10 V Analog wire (Strobe polarity = Low) PH = Pot & 0-10 V Analog wire (Strobe polarity = High)		Q = 5-pin M12/Euro Integral QD  QD models require a mating cordset
	<ul style="list-style-type: none"> <li><span style="color: blue;">●</span> B = Blue (475 nm, ±5 nm)</li> <li><span style="color: green;">●</span> G = Green (525 nm, +10/-5 nm)</li> <li><span style="color: red;">●</span> I = Infrared (850 nm)</li> <li><span style="color: red;">●</span> R = Red (625 nm, ±5 nm)</li> <li><span style="color: grey;">●</span> W = White (6500 K, +600/-500 K)</li> <li><span style="color: purple;">●</span> UV365 = UV (395 nm, +5/-0 nm)*</li> <li><span style="color: purple;">●</span> UV395 = UV (395 nm, +5/-0 nm)</li> </ul>							

\* UV365 can only be used with glass window  
\*\* Intensity adjustment not available on 145 mm length

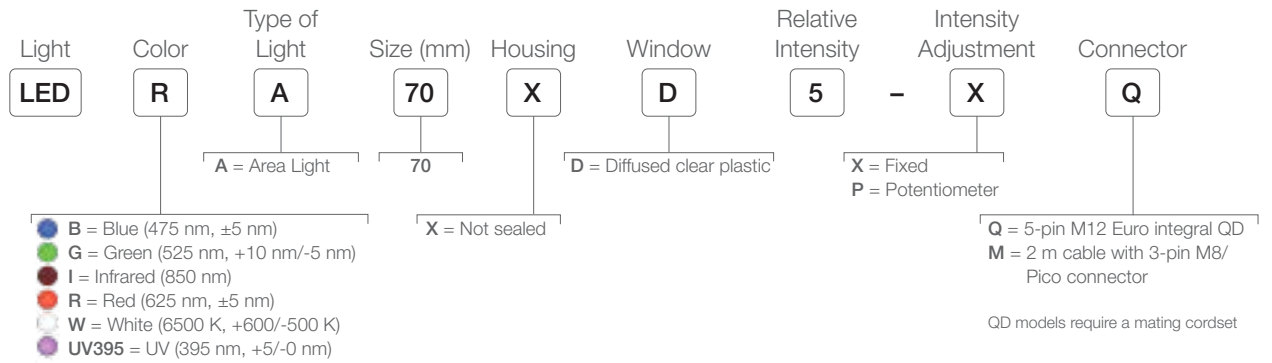
Supply Voltage	24 V DC
White 1160 mm Lux @ 0.5 m	23,420 lux
Construction	Black anodized aluminum
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IEC IP50
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	 



Array Length	"L"
145 mm	171 mm
290 mm	316.5 mm
435 mm	462 mm
580 mm	607.5 mm
870 mm	898.5 mm
1160 mm	1189.5 mm

# Area Light

Example Model Number: LEDRA70XD5-XQ



Supply Voltage

24 V DC

White Lux @ 0.5 m

7,030 lux

Construction

Housing: Black anodized aluminum  
Window: Acrylic

Operating Temperature

0 to +50 °C (+32 to +122 °F)

Environmental Rating

IEC IP50

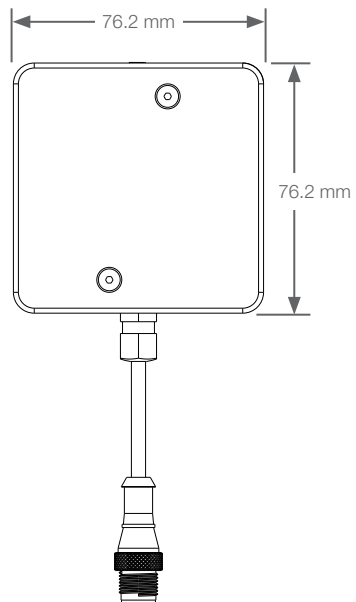
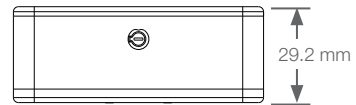
Useful life

When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models

Strobing/Control

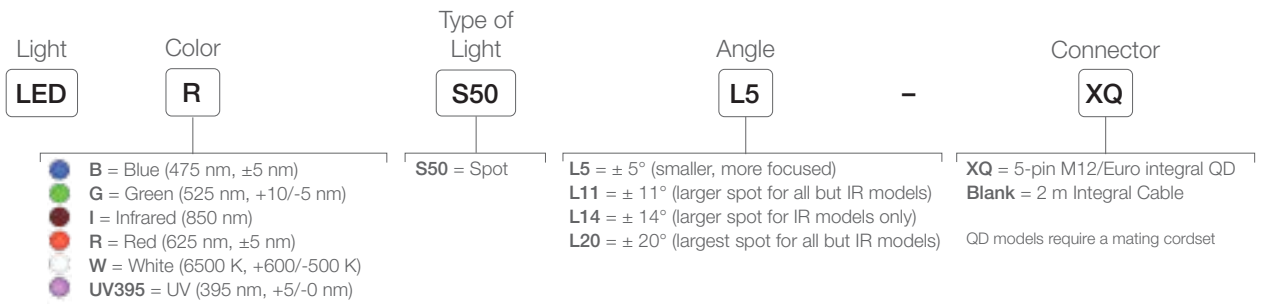
Continuous or strobed operation



Certifications

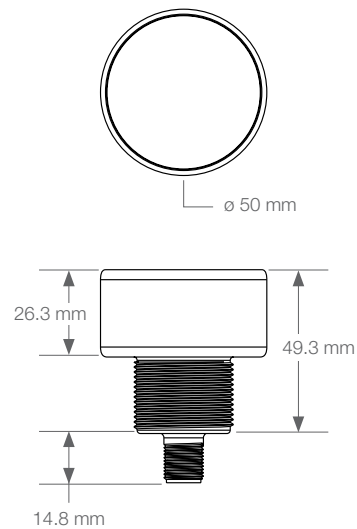


# Spot Light

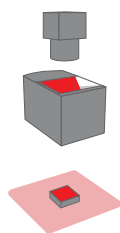
Example Model Number: LEDRS50L5-XQ



Supply Voltage	12 to 30 V DC
White ±5° Lux @ 0.5 m	3,500 Lux
Construction	Black anodized aluminum
Operating Temperature	-20 to +50 °C (-4 to +122 °F)
Environmental Rating	IEC IP67, IP69K per DIN 40050-9
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	 







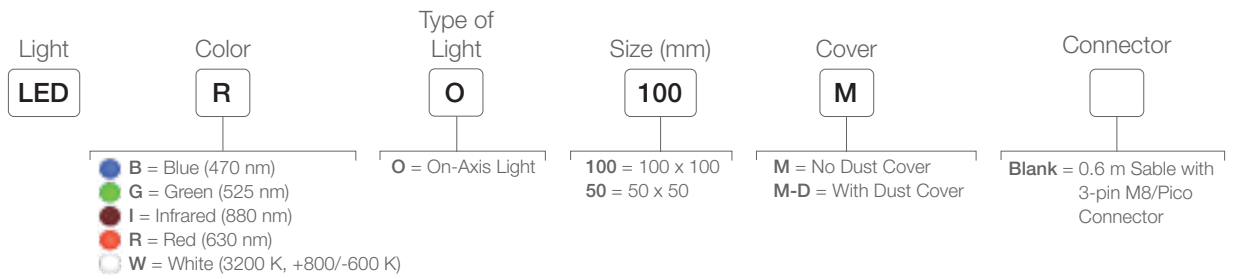
## Coaxial Lights

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- Provides more uniform illumination than a ring light
- Delivers collimated illumination in the same optical path as camera
- Evenly illuminates flat reflective surfaces
- Features models with anti-reflective glass dust covers

# Coaxial Light

Example Model Number: LEDRO100M



50 mm Models

100 mm Models

Supply Voltage

24 V DC

White Lux @ 0.5 m

50 mm: 70 Lux  
100 mm: 350 Lux

Construction

Housing: aluminum with black anodizing  
Beam Splitter: optical glass with optical coatings on both sides  
Diffuser: high-precision cast acrylic  
Dust Cover: optical glass with broadband anti-reflective coating (425 nm to 675 nm) (some models)

Operating Temperature

0 to +50 °C (+32 to +122 °F)

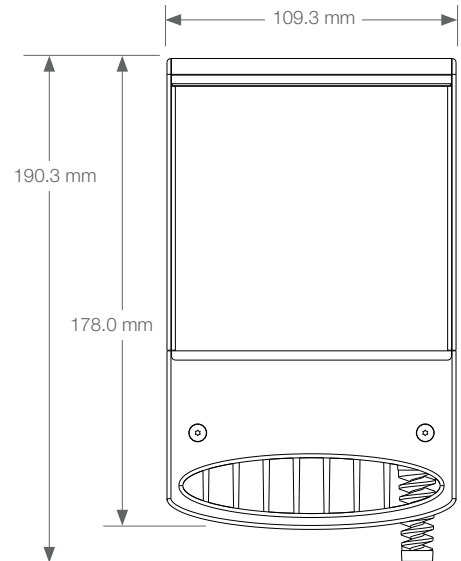
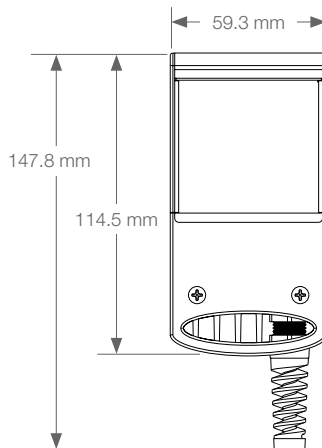
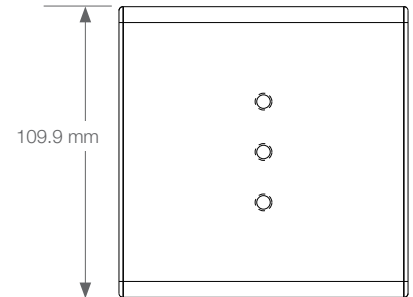
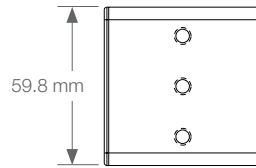
Useful life

When operated within specification, output will decrease less than 20% after 10,000 hours and less than 30% after 20,000 hours

Strobing/Control

Continuous or strobed operation

Certifications





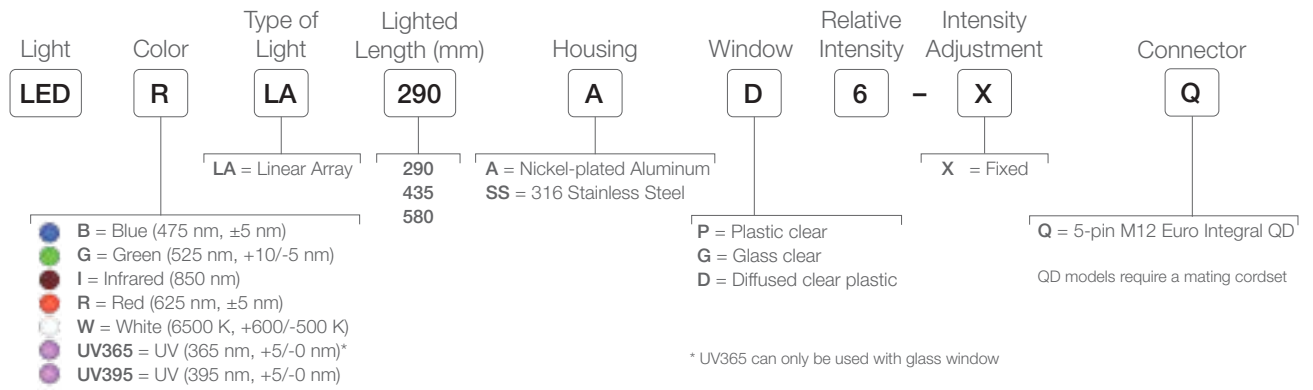
## Lights for Industrial Environments



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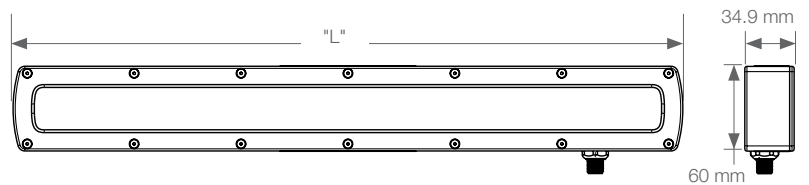
- Washdown LED Lights are sealed, smooth, and durable enough to handle the most intense applications.
- Housing options include nickel plated aluminum, 316 stainless steel or plastic bodies with multiple window options.
- Illuminates small to large areas with an even pattern of light and no shadows

# Sealed Bar Light

Example Model Number: LEDRLA290AD6-XQ



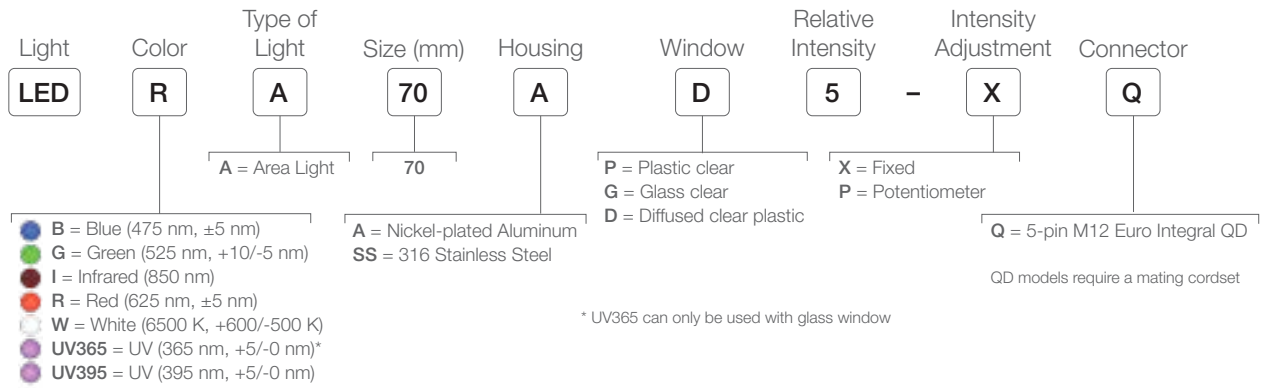
Supply Voltage	24 V dc
White 580 mm Lux @ 0.5 m	23,420 Lux
Construction	Nickel-plated aluminum or 316 stainless steel
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IEC IP68
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	 





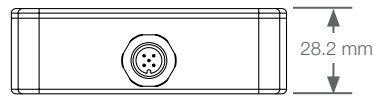
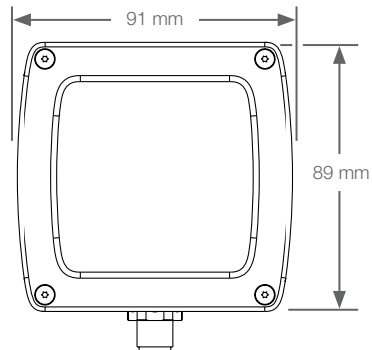
Array Length	"L"
290 mm	328 mm
435 mm	474 mm
580 mm	621 mm

# Sealed Area Light

Example Model Number: LEDRA70AD5-XQ

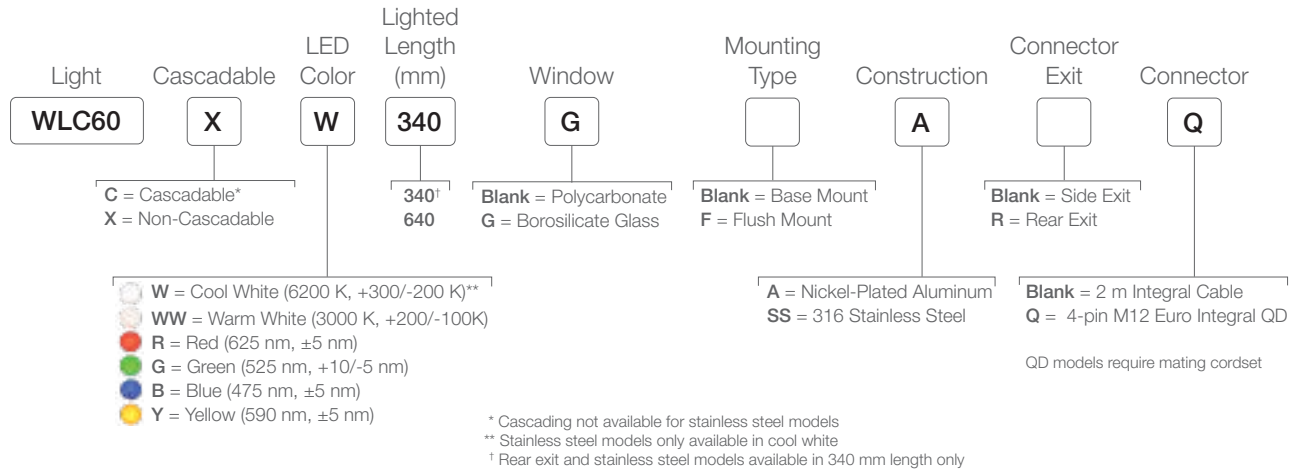


Supply Voltage	24 V DC
White Lux @0.5 m	18,550 Lux
Construction	Nickel-plated aluminum or 316 stainless steel
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IEC IP68
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	 



# WLC60 Heavy-Duty Light

Example Model Number: WLC60XW340GAQ



## Supply Voltage

12 to 30 V DC

## White 640 nm Lux @ 0.5 m

8,925 Lux

## Construction

Housing: Nickel-plated aluminum or 316 Stainless steel  
Window: Polycarbonate or Borosilicate Glass

## Operating Temperature

-40 °C to +50 °C (-40 °F to +122 °F) at the max. intensity setting  
-40 °C to +70 °C (-40 °F to +158 °F) at any of the dim settings

## Environmental Rating

IEC IP67, JIS C IP68G, IP69K per DIN 40050-9

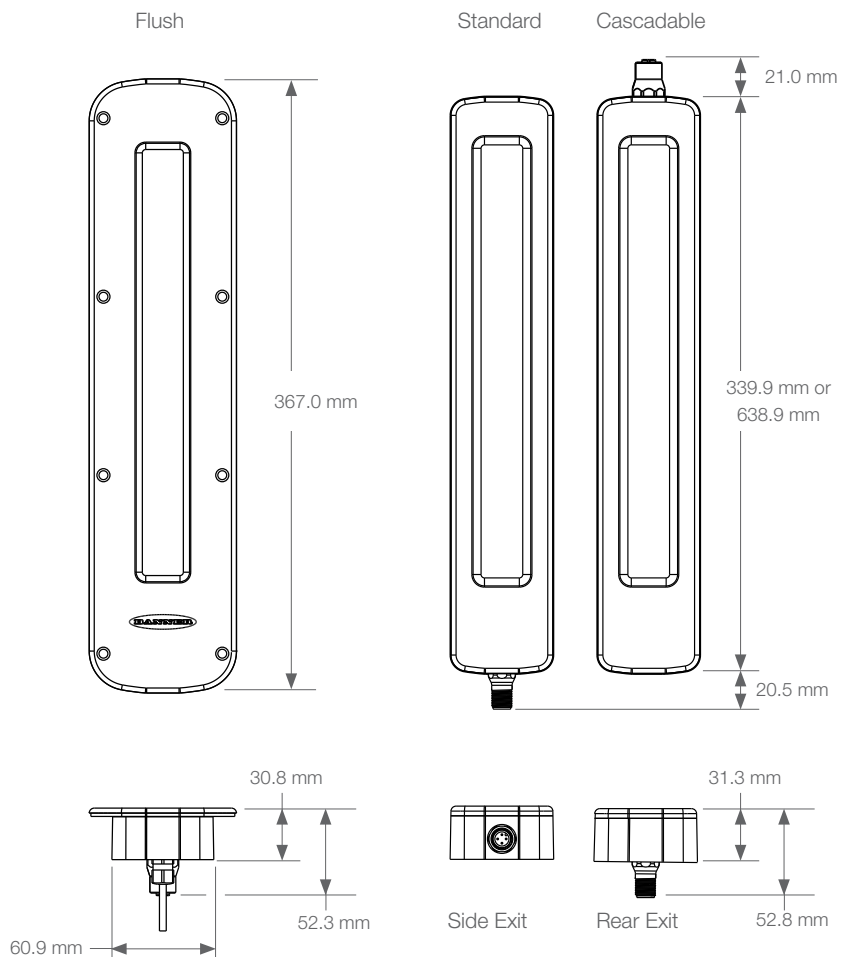
## Useful Life

When operating within specifications, output will decrease less than 30% after 60,000 hours

## Strobing/Control

Strobing is unavailable, however, certain models have PWM functionality that can act as strobing. Please visit our website for more information.

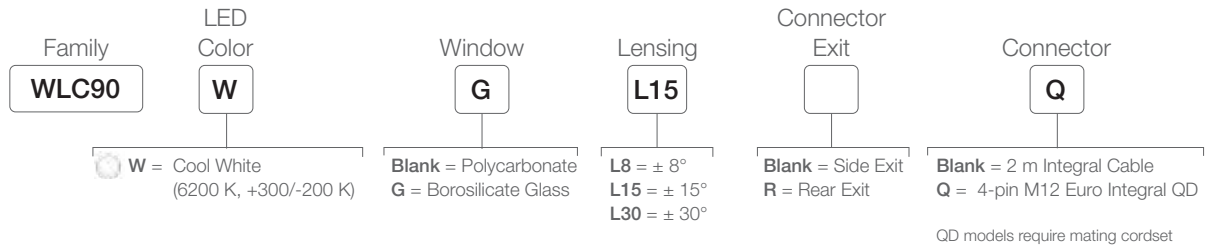
## Certifications



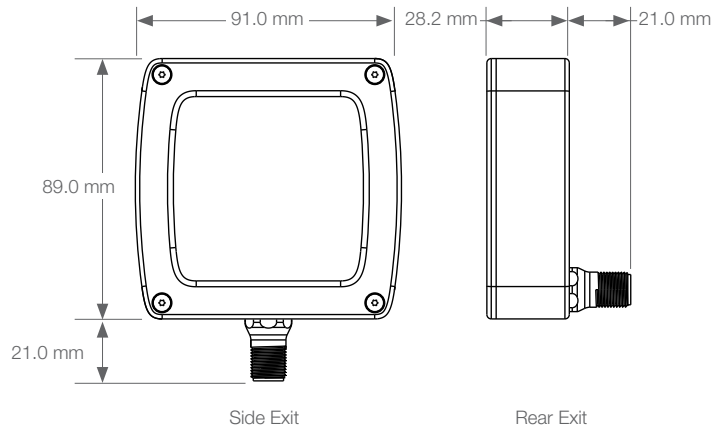


# WLC90 Heavy-Duty Light

Example Model Number: WLC90WGL15Q

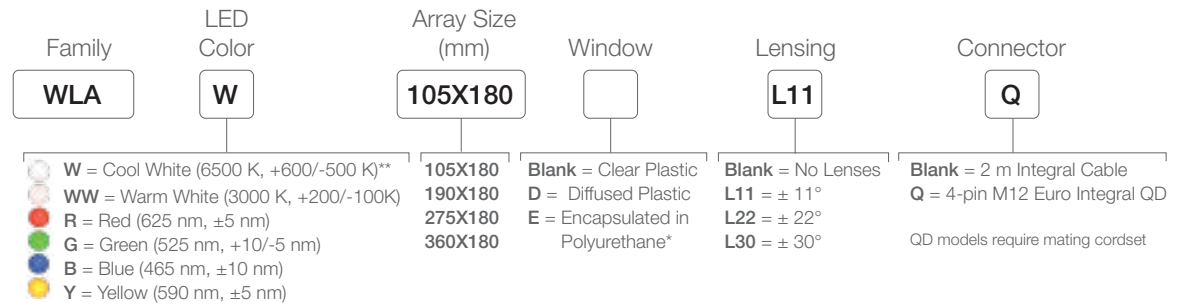


Supply Voltage	12 to 30 V DC
White ±8° Lux @ 0.5 m	22,348 Lux
Construction	Housing: Nickel-plate aluminum Window: Polycarbonate or borosilicate glass
Operating Temperature	-40 to +70 °C (-40 to +158 °F)
Environmental Rating	IEC IP67/IP68g/IP69K per DIN 40050
Useful life	When operating within specifications, output will decrease less than 30% after 60,000 hours
Strobing/Control	Strobing is unavailable, however, certain models have PWM functionality that can act as strobing. Please visit our website for more information.
Certifications	 



# WLA Area Lights

Example Model Number: WLAW105X180L11Q



\* Encapsulated models only available in cool white with no lenses

## Supply Voltage

12 to 30 V DC

## White 360 x 180 mm ±11° Lux @ 0.5 m

21,000 Lux

## Construction

Housing: PBT  
Window: Acrylic or polyurethane  
Connector: Nickel-plated brass or PVC-jacketed cable

## Operating Temperature

-20 to +50 °C (-4 to +122 °F)

## Environmental Rating

Plastic:  
Rated IEC IP67 and IP69K, per DIN 40050  
Polyurethane:  
Rated IEC IP67, IEC IP68, IP69K per DIN 40050

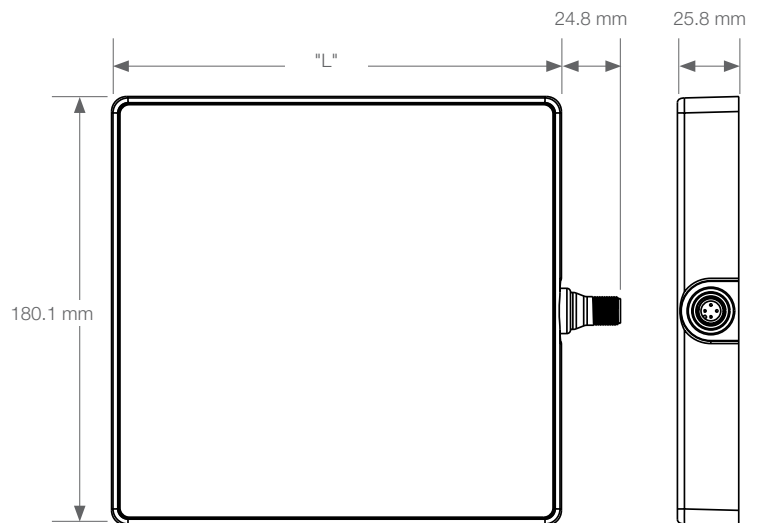
## Strobing/Control

Strobing is unavailable, however, certain models have PWM functionality that can act as strobing. Please visit our website for more information.

## Certifications



Encapsulated models not UL listed



"L"

105.1 mm

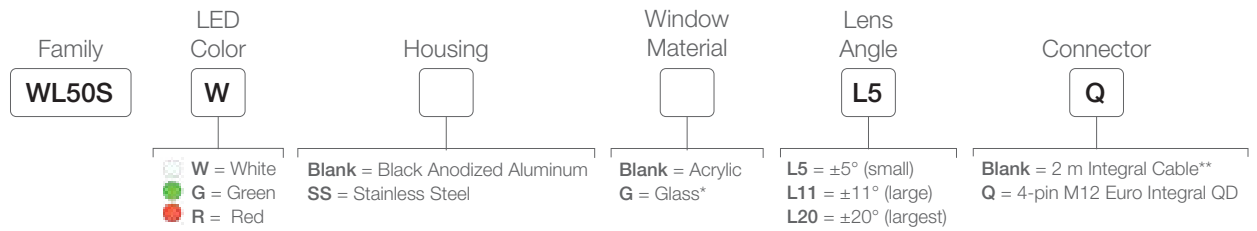
188.9 mm

272.7 mm

356.6 mm

# WL50S Spot Light

Example Model Number: WL50SWL5Q



\* Only available on stainless steel models  
 \*\* Only available on anodized aluminum models

QD models require mating cordset

**Supply Voltage** 12 to 30 V DC

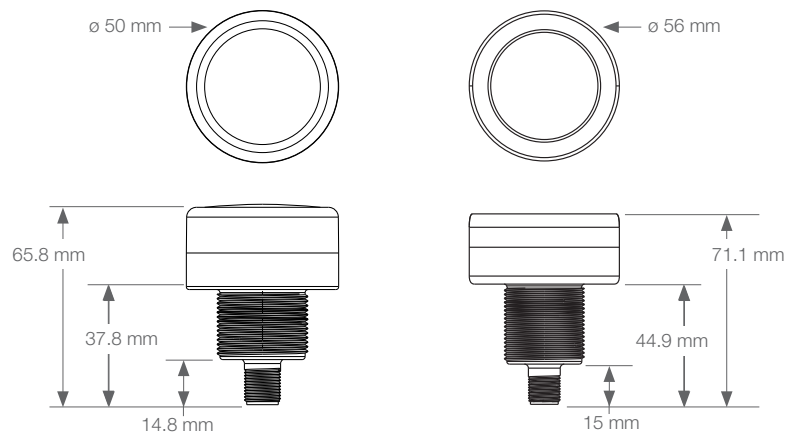
**White ±5° Lux @ 0.5 m** 3.500 Lux

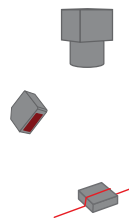
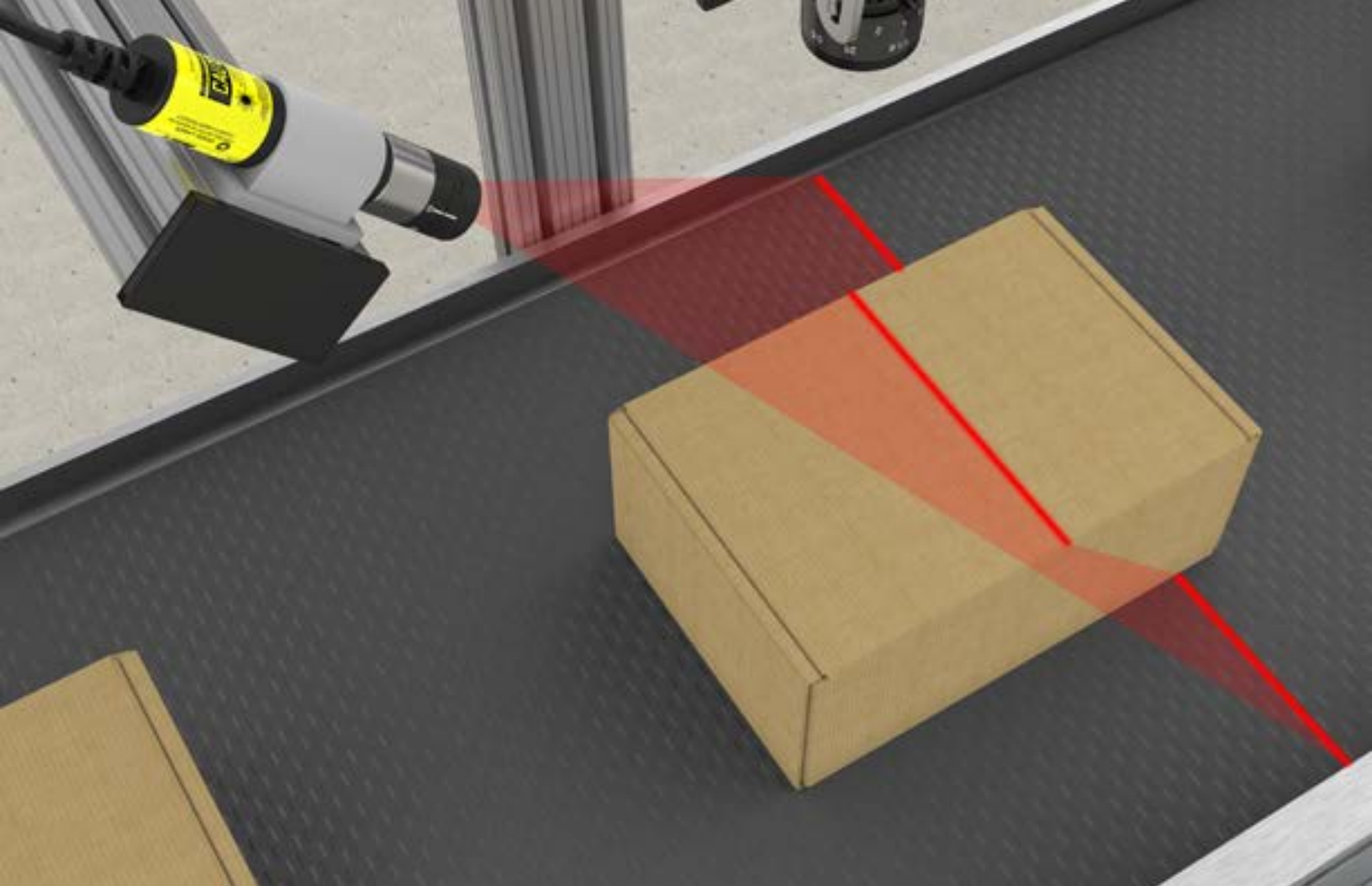
**Construction**  
 Housing: Black anodized aluminum or Stainless Steel with FDA-grade silicone gasket and Viton® o-ring seal  
 Window: Polycarbonate or glass window  
 Connector: Nickel-plated QD connector or PVC-jacketed cable  
 Mounting Nut: Black zinc-plated steel or Stainless Steel

**Operating Temperature** -20 to +50 °C (-4 to +122 °F)

**Environmental Rating** IEC IP67/IP68g/IP69K per DIN 40050

**Certifications**  



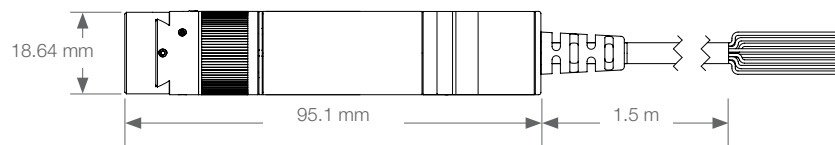


## Structured Lights

- Provides more uniform illumination than a ring light
- Delivers collimated illumination in the same optical path as camera
- Evenly illuminates flat reflective surfaces

**LLG660P10A60II**  
Laser Line Generator

660 nm, 10 mW, 60 degree fan angle, Class II CDRH,  
0.5 m cable with flying leads








# Accessories

## Brackets

							
<b>SMBBSSM</b> Used with Area Lights & Backlights	<b>SMBAMS70A</b> Used with Area Lights	<b>SMBAMS70AS</b> Used with Sealed Area Lights	<b>SMBLASRA</b>	<b>SMBLAXRA*</b> Used with Bar Lights	<b>SMBLAXU*</b>		
				*Use SMBLAXRA and SMBLAXU to create swivel bracket			
							
<b>SMB30A</b>	<b>SMB30SC</b>	<b>SMB30FA</b> Used with Spotlights	<b>SMBAMS30P</b>	<b>SMB30MM</b>	<b>SMBAMS30RA</b>	<b>SMBBSRA</b> Used with WLA	<b>SMBWLAMAG</b>
							
<b>LMBWLC60F</b>	<b>LMBWLC60RA</b> Used with WLC60	<b>LMBWLC60RAS</b>	<b>LMBWLC60MAG</b>	<b>LMBWLC90PT</b> Used with WLC90	<b>SMBAMS70AS</b>		

## Cordsets

	<b>Nickel-Plated Nut</b>	<b>Stainless Steel Nut</b>		<b>Nickel-Plated Nut</b>	<b>Stainless Steel Nut</b>
<b>M12/Euro-Style</b> Straight connector models listed; for right-angle, add <b>RA</b> to the end of the model number (example, <b>MQDC20-506RA</b> )	<b>MQDC20-506</b> 2 m (6.5') <b>MQDC20-515</b> 5 m (15') <b>MQDC20-530</b> 9 m (30')	<b>MQDC20SS-506</b> 2 m (6.5') <b>MQDC20SS-515</b> 5 m (15') <b>MQDC20SS-530</b> 9 m (30')	<b>3-Pin Pico-Style</b> Straight connector models listed	— <b>PKG3M-5</b> 5 m (16') <b>PKG3M-7</b> 7 m (23') <b>PKG3M-10</b> 10 m (33')	<b>PKG3M-4</b> 4 m (13') — <b>PKG3M-7</b> 7 m (23') <b>PKG3M-10</b> 10 m (33')
<b>M12/Euro-Style</b> Straight connector models listed; for right-angle, add <b>RA</b> to the end of the model number (example, <b>MQDC1-506RA</b> )	<b>4-Pin</b> <b>MQDC-406</b> 2 m (6.5') <b>MQDC-415</b> 5 m (15') <b>MQDC-430</b> 9 m (30')	<b>5-Pin</b> <b>MQDC1-506</b> 2 m (6.5') <b>MQDC1-515</b> 5 m (15') <b>MQDC1-530</b> 9 m (30')		<b>PKG3M-.35-PSG3M</b> 0.35 m (1 ft) <b>PKG3M-2-PSG3M</b> 2 m (6.5 ft)	
<b>4-Pin M12/ Euro-Style Washdown</b> Straight connector models only	<b>4-Pin</b> <b>MQDC-WDSS-0406</b> 2 m (6.5') <b>MQDC-WDSS-0415</b> 5 m (15') <b>MQDC-WDSS-0430</b> 9 m (30')	<b>5-Pin</b> <b>MQDC-WDSS-0506</b> 2 m (6.5') <b>MQDC-WDSS-0515</b> 5 m (15') <b>MQDC-WDSS-0530</b> 9 m (30')	<b>Pico-Style Double-Ended</b> Straight connector models listed		<b>Pico-Style Splitter</b> Straight connector models listed. One 3-pin Pico QD and one 4-Pin Euro QD.
<b>4-Pin M12/Euro-Style Double-Ended</b> (straight male/straight female connectors)	<b>MQDEC-401SS-PUR</b> 0.3 m (1') <b>MQDEC-403SS-PUR</b> 1 m (3') <b>MQDEC-406SS-PUR</b> 2 m (6.5')			<b>Pico-Style Splitter</b> Straight connector models listed	<b>CSB-UNT213M831F1241<sup>††</sup></b> Branches = 0.3 m (1ft) Trunk = Flying leads
					<b>CSB-M831M831<sup>†</sup></b> Branches = 0.20 m (0.65 ft) Trunk = 0.20 m (0.65 ft)

<sup>††</sup> Enables strobe signal from P4 while obtaining power from an external source

<sup>†</sup> Powers 2 lights from one P4 sensor



**PSDINA-24**  
Special Lights Power  
supply 24V DC; Power  
supply 24V DC



**PSD-24-4**  
Class 2 Power Supply  
Input: 90-264 V ac 1.5A  
Output: 24 V DC 3.9A  
2 m (6.5') 4-Pin Euro Connector

## Polarizing Filters

Description	Models
Linear Polarizing filter kit for 80 x 80 Area Lights and 70 x 70 Backlights	LEDAPFK
Linear Polarizing filter kit for 90 mm IP68 Ring Lights	LEDRPFK90
Linear Polarizing filter kit for 145 mm Bar Lights (IP50)	LEDLAPFK145
Linear Polarizing filter kit for 290 mm Bar Lights (IP50)	LEDLAPFK290
Linear Polarizing filter kit for 435 mm Bar Lights (IP50)	LEDLAPFK435
Linear Polarizing filter kit for 580 mm Bar Lights (IP50)	LEDLAPFK580
Linear Polarizing filter kit for 870 mm Bar Lights (IP50)	LEDLAPFK870
Linear Polarizing filter kit for 1160 mm Bar Lights (IP50)	LEDLAPFK1160
Linear Polarizing filter kit for 70 mm High-Intensity Area Lights	LEDAPFK70
Linear Polarizing filter kit for 70 mm High-Intensity Ring Lights	LEDRPFK70
Linear Polarizing filter kit for 70 mm IP68 High-Intensity Area Lights	LEDAPFK70S
Linear Polarizing filter kit for 50mm High-Intensity Spot Lights	LEDS50PFK

## Window Replacements and Lighting Diffusers

Use With	Models
<b>Clear Glass</b>	
70 mm Sealed IP68 High-Intensity Area Lights	LEDA70SW-G
145 mm IP50 Bar Lights	LEDLA145XW-G
290 mm IP50 Bar Lights	LEDLA290XW-G
290 mm Sealed IP68 Bar Lights	LEDLA290SW-G
435 mm IP50 Bar Lights	LEDLA435XW-G
435 mm Sealed IP68 Bar Lights	LEDLA435SW-G
580 mm IP50 Bar Lights	LEDLA580XW-G
580 mm Sealed IP68 Bar Lights	LEDLA580SW-G
870 mm IP50 Bar Lights	LEDLA870XW-G
1160 mm IP50 Bar Lights	LEDLA1160XW-G
<b>White Plastic</b>	
70 x 70 mm Red Backlights	LEDBW
70 x 70 mm Infrared Backlights	LEDBIW
85 x 220 mm Red Backlights	LEDBWL
85 x 220 mm Infrared Backlights	LEDBIWL
<b>White Plastic Diffuse</b>	
	<b>Models</b>
70 mm Sealed High-Intensity Area Lights	LEDA70SVDW-P
145 mm IP50 Bar Lights	LEDLA145XVDW-P
290 mm IP50 Bar Lights	LEDLA290XVDW-P
290 mm Sealed IP68 Bar Lights	LEDLA290SVDW-P
435 mm IP50 Bar Lights	LEDLA435XVDW-P
435 mm Sealed IP68 Bar Lights	LEDLA435SVDW-P
580 mm IP50 Bar Lights	LEDLA580XVDW-P
580 mm Sealed IP68 Bar Lights	LEDLA580SVDW-P
870 mm IP50 Bar Lights	LEDLA870XVDW-P
1160 mm IP50 Bar Lights	LEDLA1160XVDW-P

Use With	Models
<b>Clear Plastic</b>	
70 mm Sealed High-Intensity Area Lights	LEDA70SW-P
145 mm IP50 Bar Lights	LEDLA145XW-P
290 mm IP50 Bar Lights	LEDLA290XW-P
290 mm Sealed IP68 Bar Lights	LEDLA290SW-P
435 mm IP50 Bar Lights	LEDLA435XW-P
435 mm Sealed IP68 Bar Lights	LEDLA435SW-P
580 mm IP50 Bar Lights	LEDLA580XW-P
580 mm Sealed IP68 Bar Lights	LEDLA580SW-P
870 mm Sealed IP50 Bar Lights	LEDLA870XW-P
1160 mm IP50 Bar Lights	LEDLA1160XW-P
<b>Clear Plastic Diffuse</b>	
70 mm High-Intensity Ring Lights	LEDR70CDW
70 mm High-Intensity Area Lights	LEDA70CDW
70 mm Sealed IP68 High-Intensity Area Lights	LEDA70SCDW-P
145 mm IP50 Bar Lights	LEDLA145XCDW-P
290 mm IP50 Bar Lights	LEDLA290XCDW-P
290 mm Sealed IP68 Bar Lights	LEDLA290SCDW-P
435 mm IP50 Bar Lights	LEDLA435XCDW-P
435 mm Sealed IP68 Bar Lights	LEDLA435SCDW-P
580 mm IP50 Bar Lights	LEDLA580XCDW-P
580 mm Sealed IP68 Bar Lights	LEDLA580SCDW-P
870 mm IP50 Bar Lights	LEDLA870XCDW-P
1160 mm IP50 Bar Lights	LEDLA1160XCDW-P



# Vision Solutions by Banner



## Vision Sensors

Robust yet easy-to-use self-contained vision sensors perform automated inspections that previously required costly and complex vision systems. The iVu and iVu Color Image Sensors are used to monitor parts for type, size, orientation, shape, location, and color or color variations. The device can be set up and monitored using an integrated or remote touchscreen or with a PC.

## Smart Cameras

Banner's free and easy-to-use Vision Manager Software provides a number of tools and capabilities that enable VE Series Smart Cameras to solve a wide range of vision applications, such as item detection, part positioning, feature measurement and flaw analysis. Available in resolutions up to 5 MP to solve a variety of applications.



## Barcode Readers

Banner Engineering provides advanced barcode reading capabilities for traceability in a wide variety of industries. We offer rugged, reliable solutions that ensure quality, improve efficiency, and enable accurate inventory management.

Imager-based barcode readers reliably read 1D and 2D barcodes in any orientation. Banner Engineering offers code reading solutions that can reliably decode difficult-to-read, low quality, and damaged codes—as well as codes printed on highly reflective surfaces.



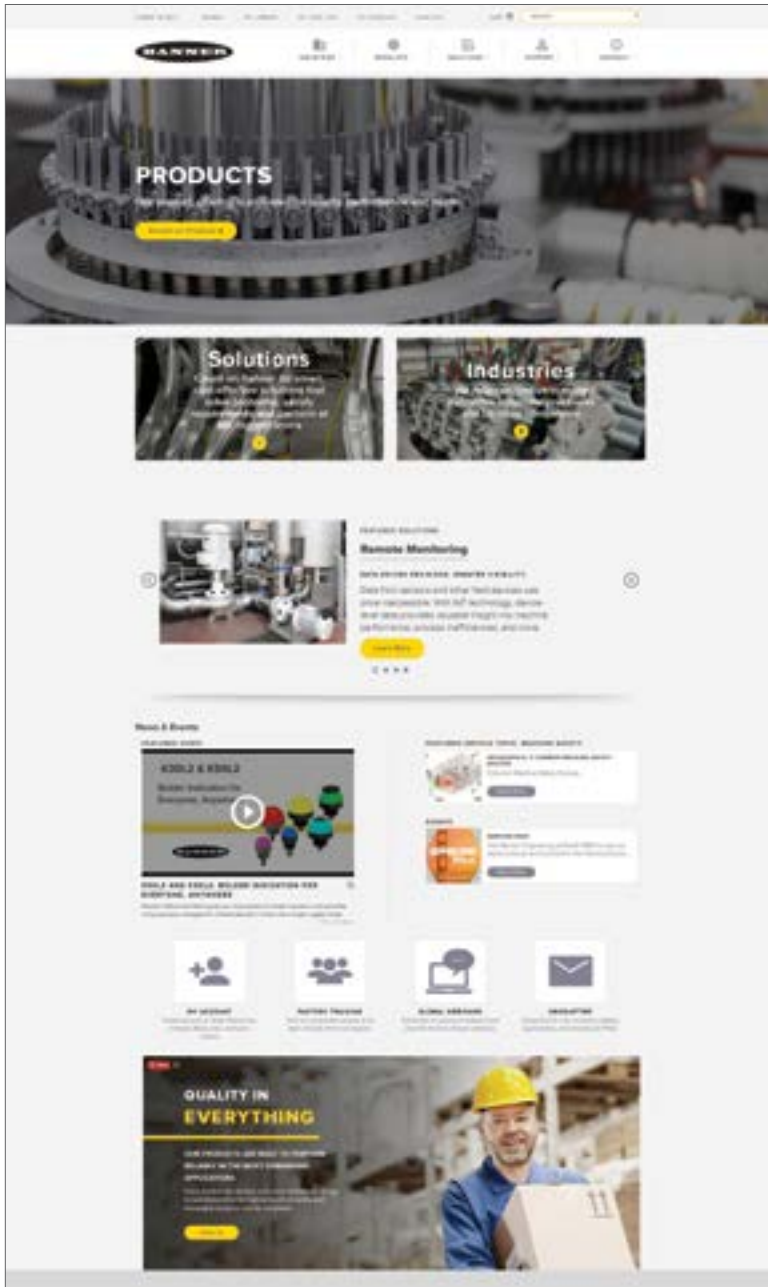
## Vision Lenses

Vision products combine high-performance tools, intelligent features, and an intuitive user interface for automated inspection applications. The vision systems are easy to use and customizable for specific machines and tasks. Adding vision lenses to industrial applications enhances overall performance and provides accurate detection for a wide variety of vision applications.



## Vision System Camera Bandpass Filters

Bandpass filters allow you to control what your camera is seeing with greater contrast and a higher transmission for a reduced cost when compared to the conventional interference filter. Ideal for LED or laser diode application use.



Trigger Sensors



Signal Tower Lights



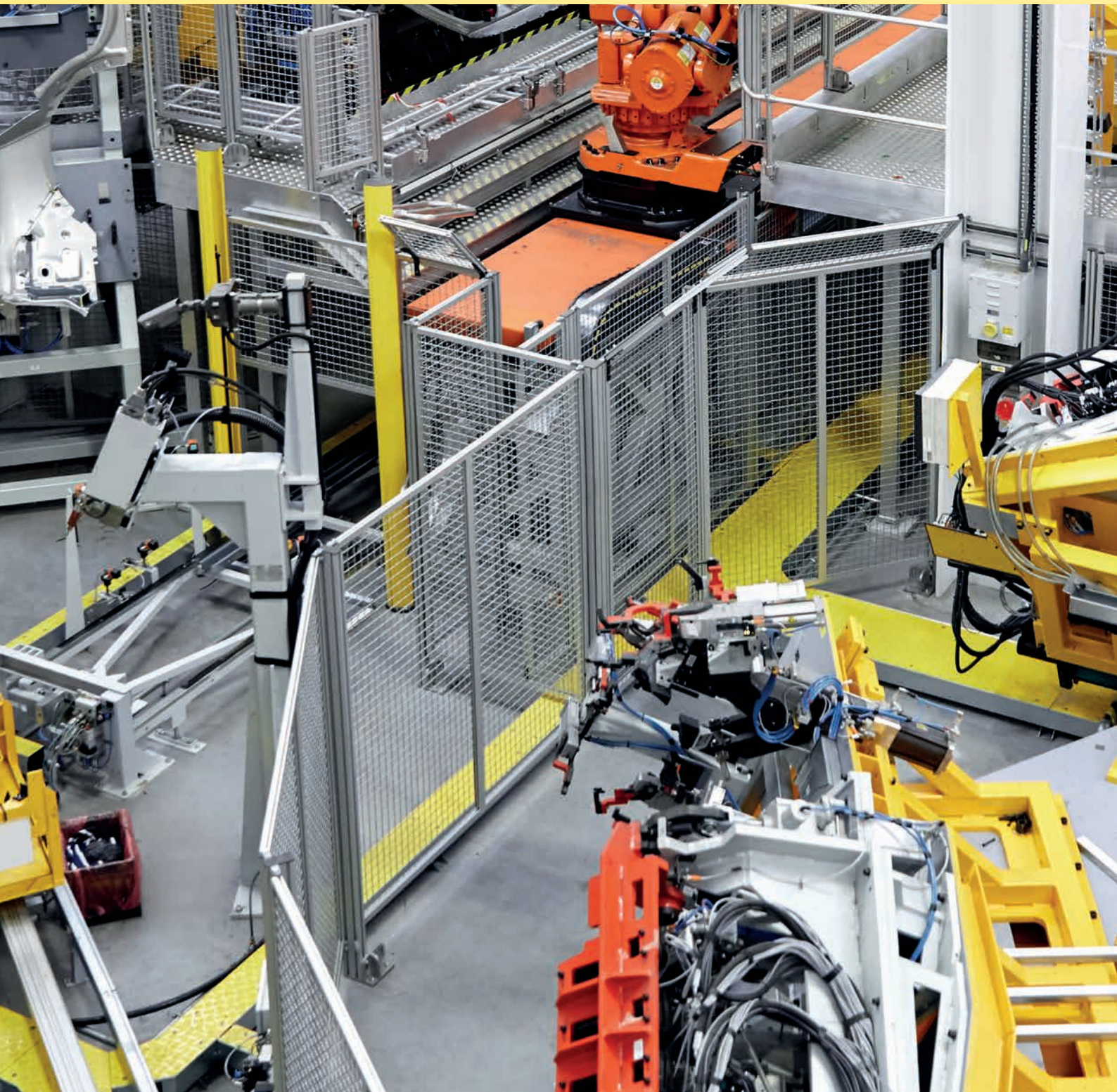
Indicator Lights



Touch Buttons



# Safety Solutions





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# Complete Safety Solutions from Banner

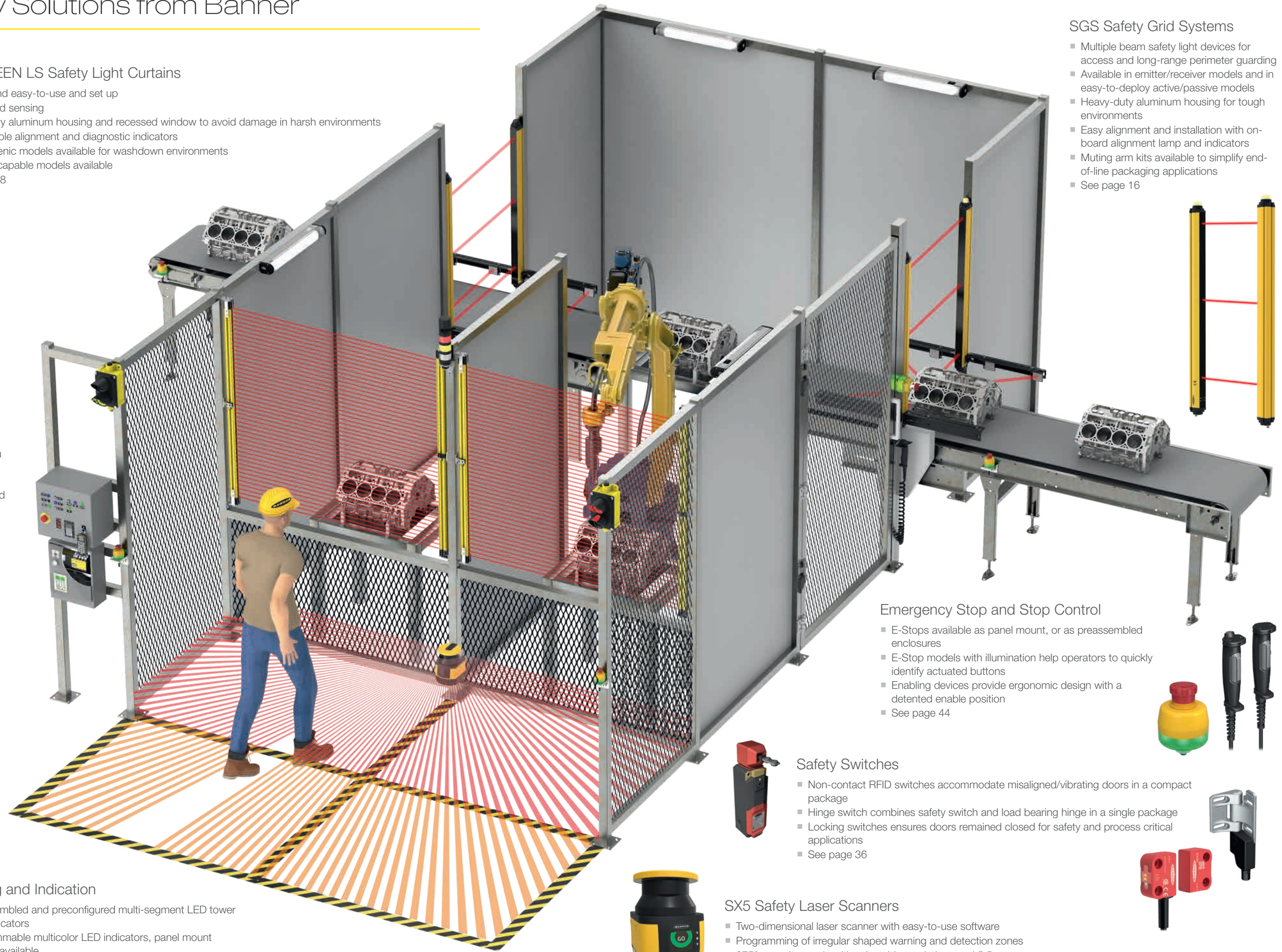


## EZ-SCREEN LS Safety Light Curtains

- Intuitive and easy-to-use and set up
- End-to-end sensing
- Heavy-duty aluminum housing and recessed window to avoid damage in harsh environments
- Highly visible alignment and diagnostic indicators
- IP69 Hygienic models available for washdown environments
- Cascade capable models available
- See page 8

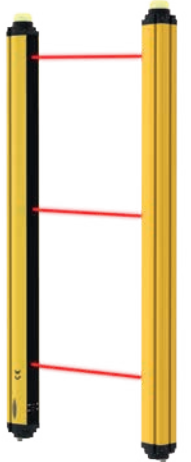
## XS26-2 Expandable Safety Controllers

- Up to eight expansion I/O modules can be added as your safety application grows or changes
- Configuration software is so simple that you will be programming in minutes
- Simulator functionality allows users to test their configurations without being connected to a controller
- See page 27



## SGS Safety Grid Systems

- Multiple beam safety light devices for access and long-range perimeter guarding
- Available in emitter/receiver models and in easy-to-deploy active/passive models
- Heavy-duty aluminum housing for tough environments
- Easy alignment and installation with on-board alignment lamp and indicators
- Muting arm kits available to simplify end-of-line packaging applications
- See page 16



## Emergency Stop and Stop Control

- E-Stops available as panel mount, or as preassembled enclosures
- E-Stop models with illumination help operators to quickly identify actuated buttons
- Enabling devices provide ergonomic design with a detented enable position
- See page 44



## Safety Switches

- Non-contact RFID switches accommodate misaligned/vibrating doors in a compact package
- Hinge switch combines safety switch and load bearing hinge in a single package
- Locking switches ensures doors remained closed for safety and process critical applications
- See page 36



## Lighting and Indication

- Preassembled and preconfigured multi-segment LED tower light indicators
- Programmable multicolor LED indicators, panel mount models available
- Pro Editor software offers a wide variety of color and animation options



## SX5 Safety Laser Scanners

- Two-dimensional laser scanner with easy-to-use software
- Programming of irregular shaped warning and detection zones
- 275° scanning angle with selectable resolutions and 5.5 m range
- See page 22





# Network Technology down to the Sensor Level

## In-Series Diagnostics (ISD)



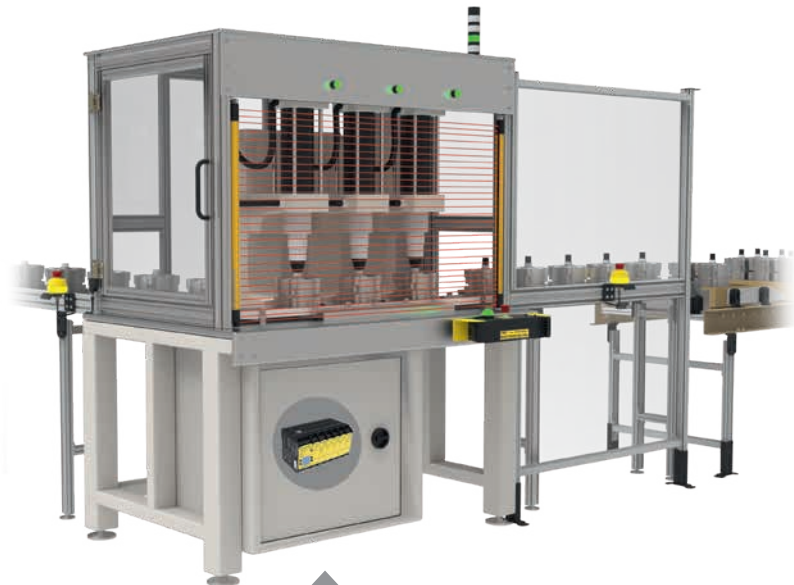
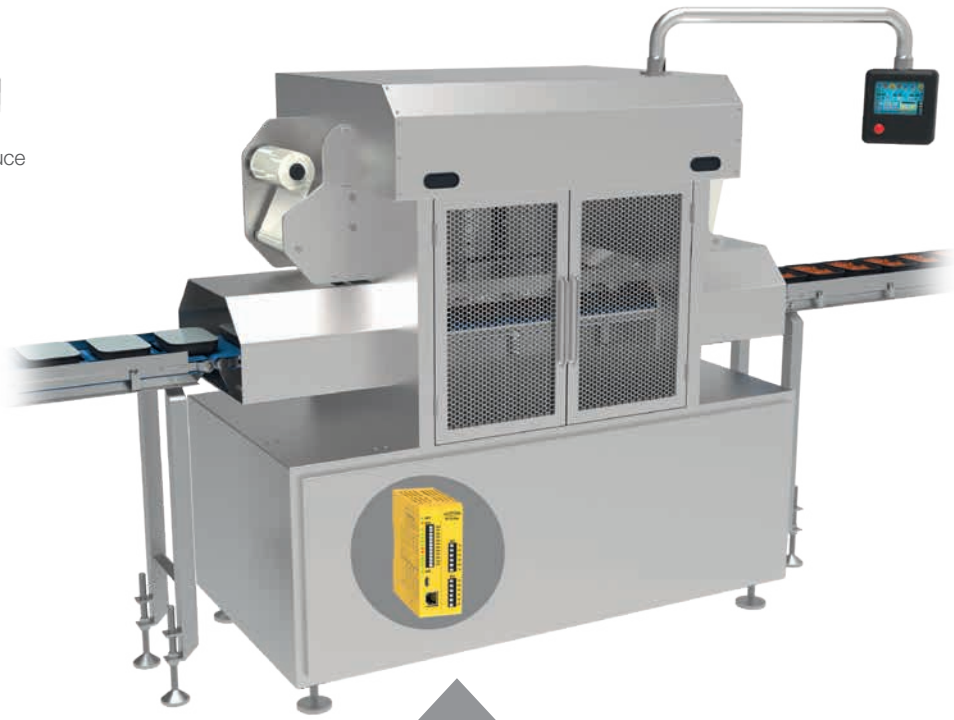
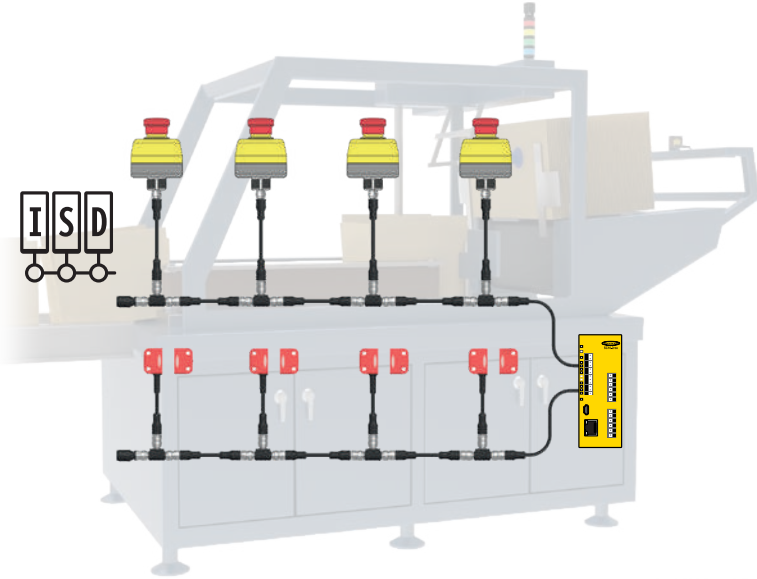
Cut Costs



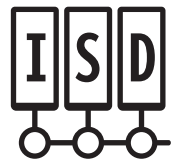
Simplify Installation & Troubleshooting



Prevent & Reduce Downtime



HMI / PLC



### Banner In-Series Diagnostics

- Up to 32 ISD devices connected with one in-series cable communicate directly with PLC/HMI
- ISD provides an array of data including device status, voltage, temperature, RFID tag value, sensing distance and more

1234567890

74.5°C

13.7v

Status: ON

Alignment: OK

08.0mm

### Safety System Diagnostics

- Reduce downtime by quickly diagnosing safety events and displaying them on the HMI
- Prevent Downtime with ISD preventative maintenance alerts

### Virtual Reset

- Eliminate physical button & wires
- Reset from touch screen HMI over Industrial Ethernet

### Industrial Ethernet

EtherNet/IP<sup>™</sup>  
PCCC



### Intuitive setup and PLC integration

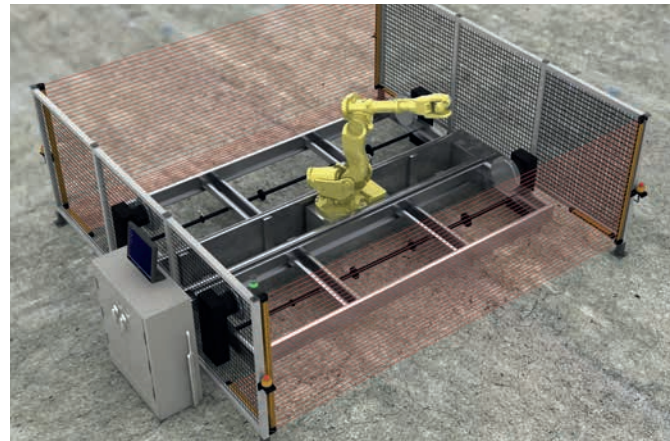
- Free, Easy to use PC software
- Export tag feature for easy tag creation in a PLC (Patent Pending)



# Type 4 Heavy-Duty Light Curtains

Robust safety light curtains for harsh industrial environments

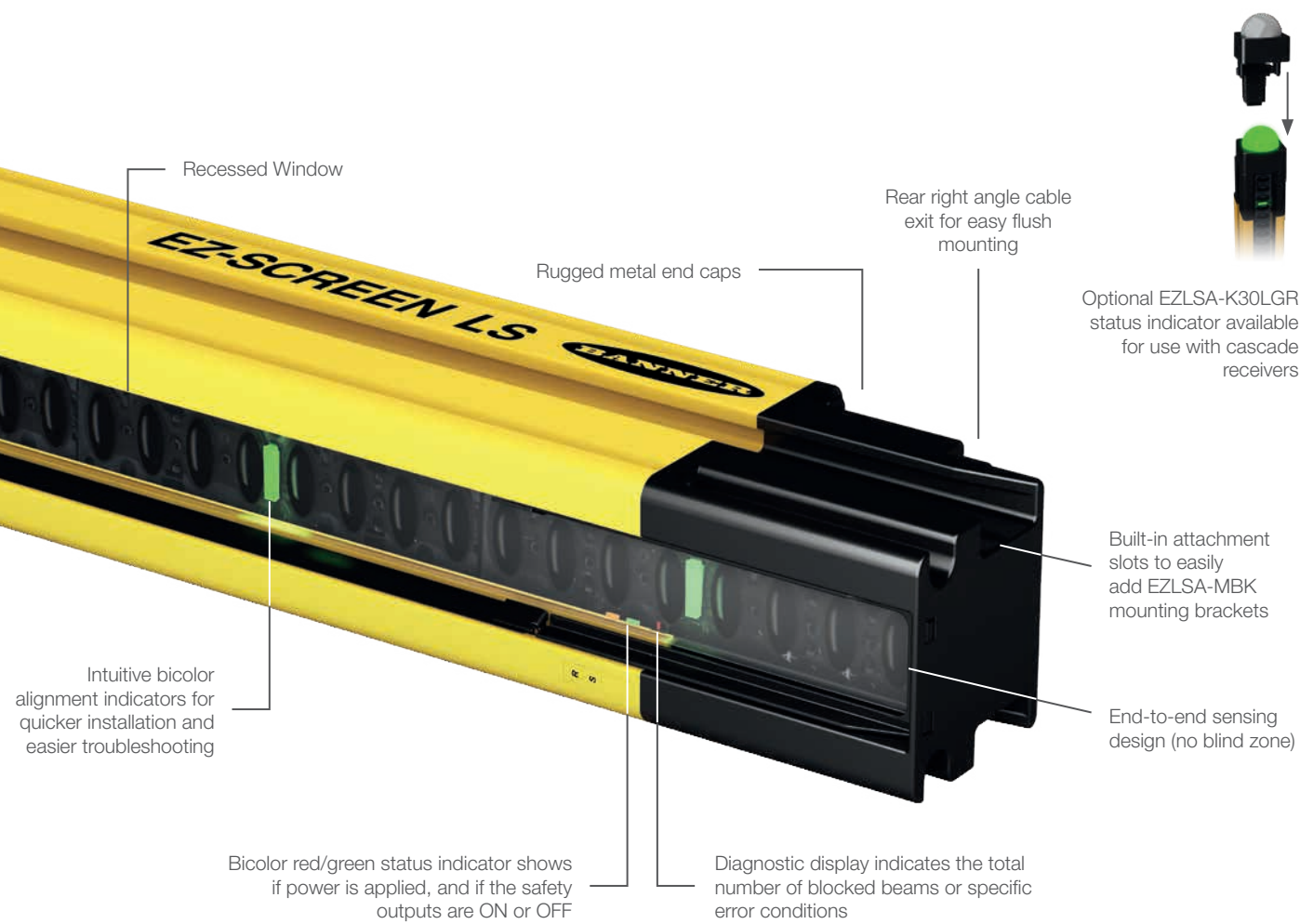
Banner Engineering's easy-to-use, heavy-duty Type 4 safety light curtains with several resolution options available to detect fingers, hands, arms, or legs. Our heavy duty light curtains are built to withstand harsh industrial environments.



Due to its robust design, the EZ-SCREEN LS is the perfect fit in large robotic cell applications that require sturdy safety devices and heavy duty enclosures.



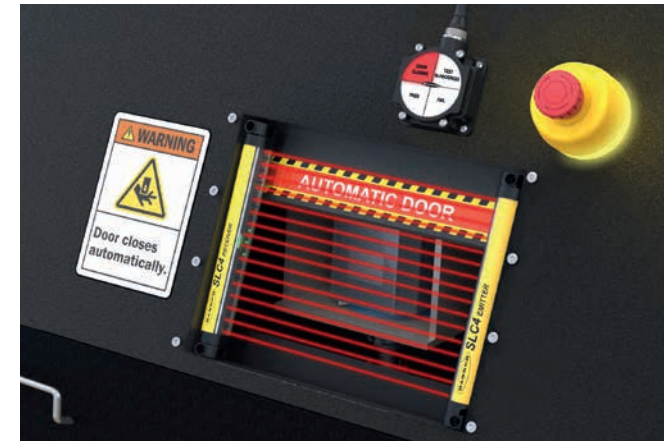
EZ-SCREEN LS light curtains in hygienic tubular enclosures successfully protect operators from injury and remain hygienic for easy cleaning procedures.



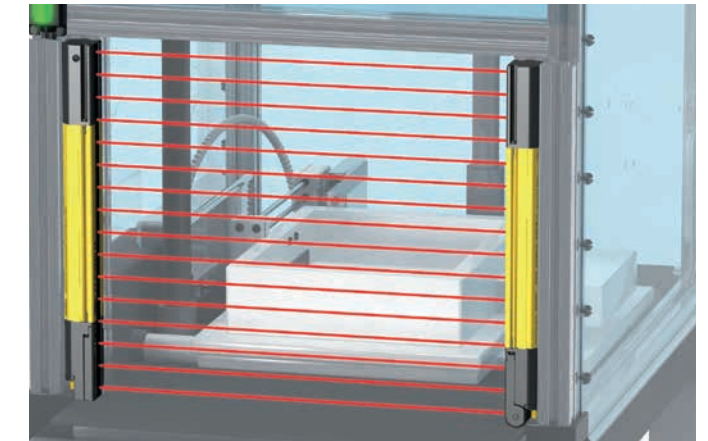
# Type 4 Compact Light Curtains

Compact safety light curtains for safety in tight spaces

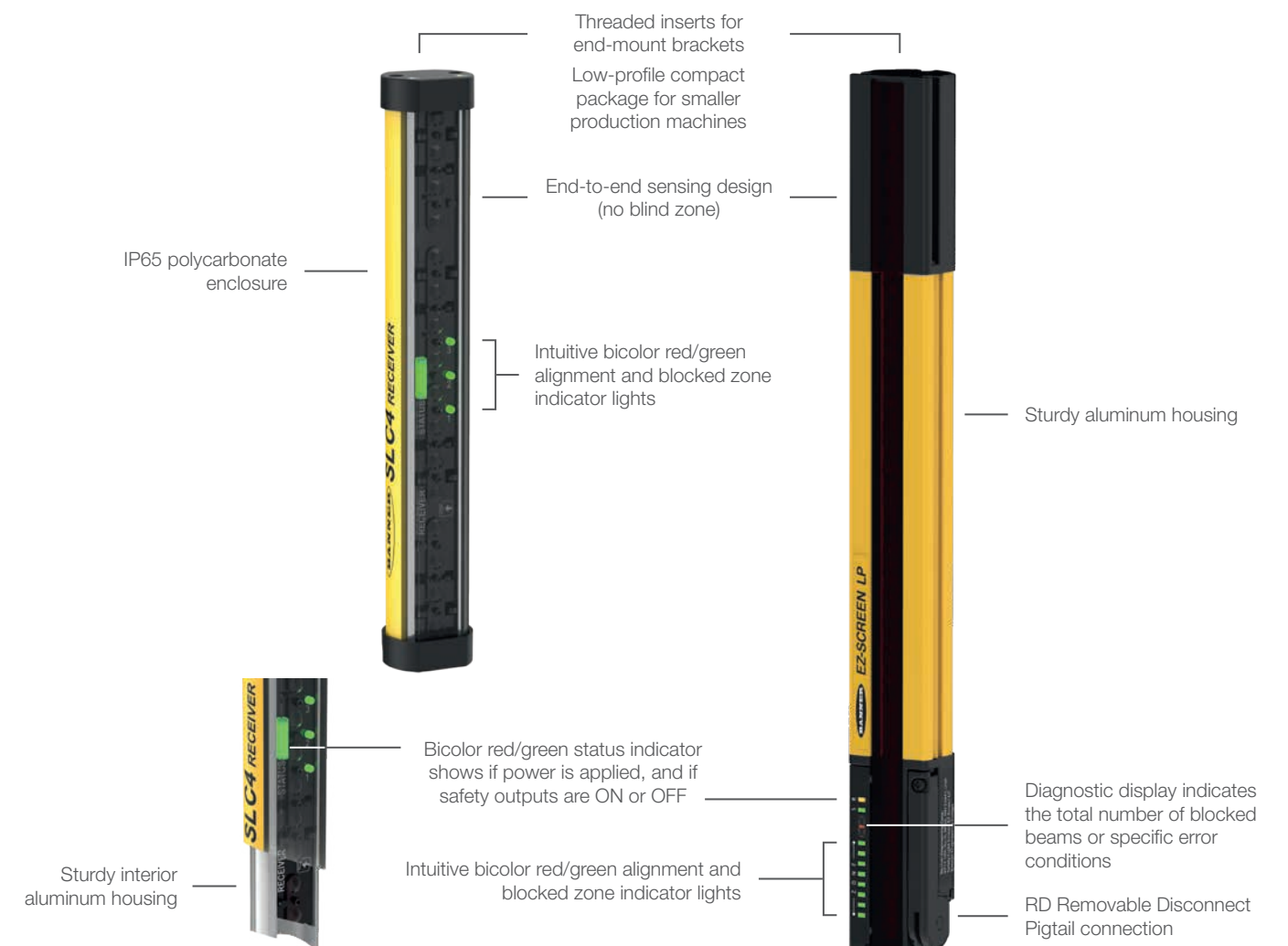
Banner Engineering's easy-to-use, compact Type 4 safety light curtains are available with several resolution options available to detect fingers, hands, arms, or legs. Our compact safety light curtains are ideal for smaller machines and other space-constrained areas.



SLC4 are Type 4 safety light curtains specifically designed to safeguard smaller points of operation and access on compact machines.



The EZ-SCREEN LP safety light screen is compact and mounts in tight spaces with its continual end-to-end sensing that leaves no gaps.

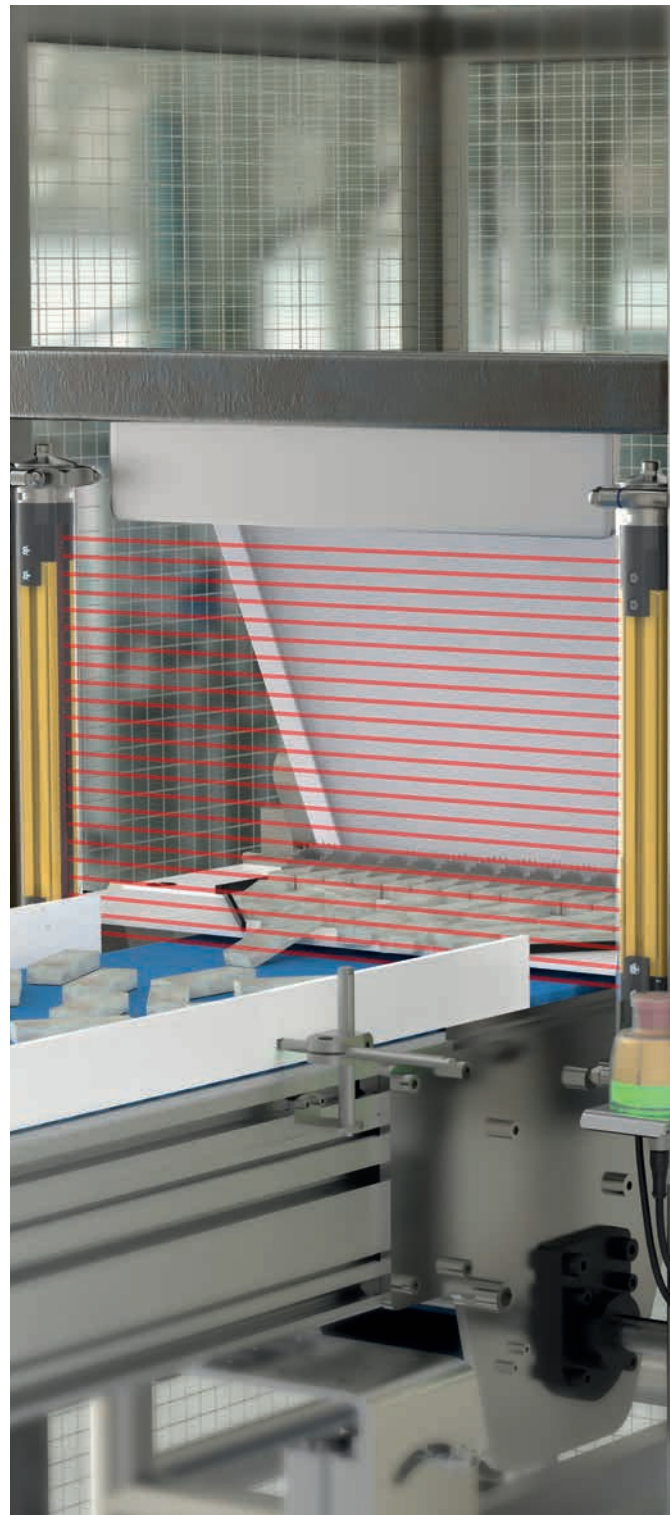




# Safety Light Curtain Selection

Choose your safety light curtain, suitable for a wide variety of safety applications.

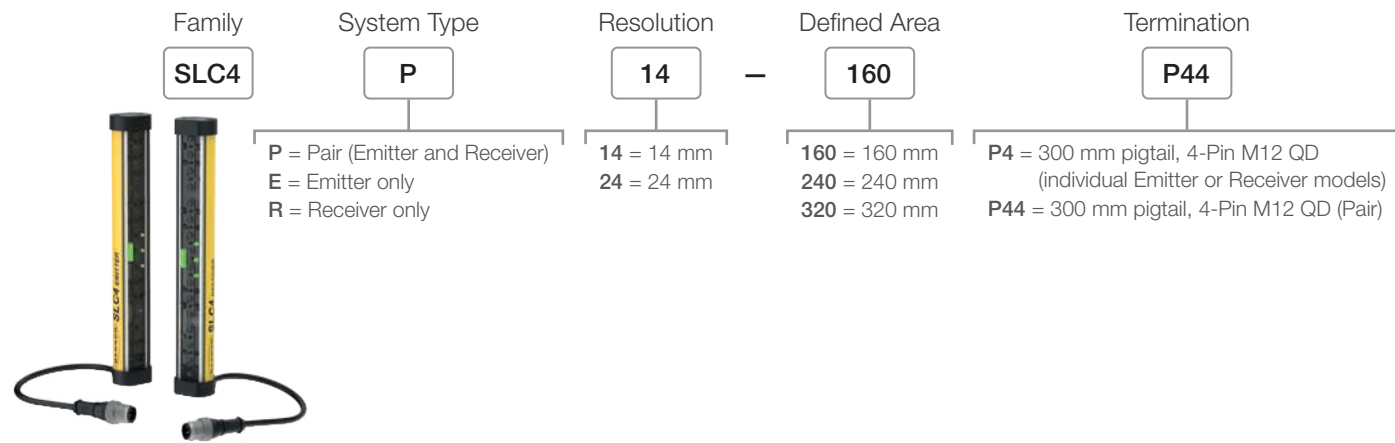
- Heavy-Duty Type 4 robust safety light curtains for harsh industrial environments
- Compact Type 4 safety light curtains for safety in tight spaces
- Type 2 cost-effective safety light curtains for lower risk applications



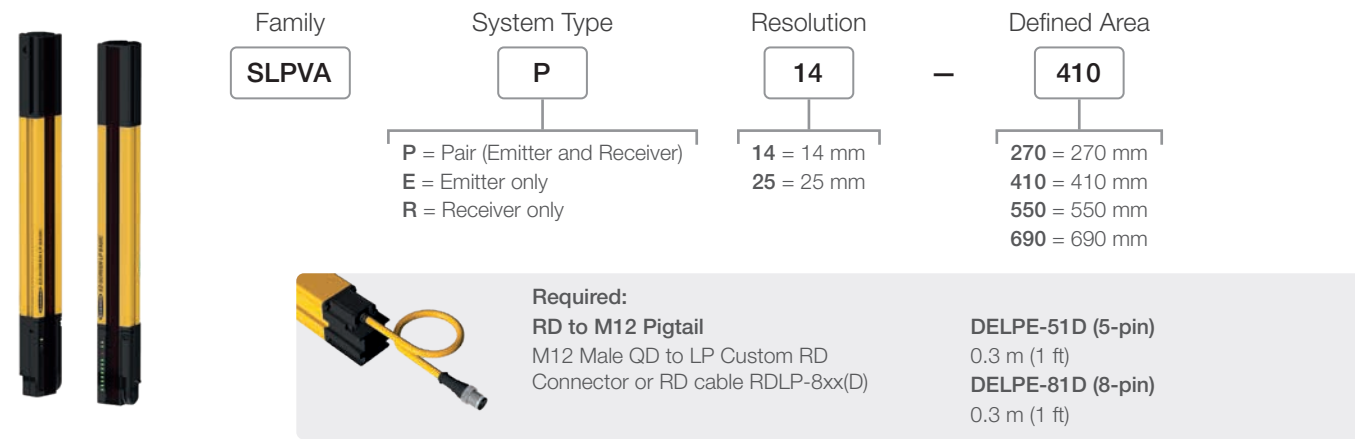
	Compact Type 4		Compact Type 4		Heavy-Duty Type 4		Type 2
	SLC4	EZ-SCREEN LP Basic	EZ-SCREEN LP	EZ-SCREEN LP with Muting	EZ-SCREEN LS	EZ-SCREEN	EZ-SCREEN
Finger Detection							
Hand Detection							
Muting/Presence Detection							
Family	SLC4	SLPVA	SLP	SLPMP	SLL	SLS	LS2
Type IEC 61496-1, -2	Type 4	Type 4	Type 4	Type 4	Type 4	Type 4	Type 2
Safety Rating EN ISO 13849-1; IEC 61508; IEC 62061	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 2 PL c
Dimensions W x D (mm)	26.7 x 22.1	28 x 26	28 x 26	28 x 26	36 x 45	36 x 45.2	25.4 x 31.8
Resolution (mm)	14, 24 mm	14, 25 mm	14, 25 mm	14, 25 mm	14, 23, 40 mm	14, 30 mm	30 mm
Max Sensing Range (m)	0.1 to 2 m	0.1 to 4 m	0.1 to 7 m	0.1 to 7 m	0.1 to 12 m	14: 0.1 to 6 m 30: 0.1 to 18 m	0.2 to 15 m
Defined Area (mm)	160 mm 240 mm 320 mm	270, 410, 550, 690 mm	270 to 1250 mm	410 to 1250 mm	280 to 1820 mm	14: 150 to 1800 mm 30: 150 to 2400 mm	150 to 1800 mm
Increments (mm)	Not applicable	Not applicable	140 mm	140 mm	70 mm	150 mm	150 mm
<b>Functions</b>							
Reset	–	–	✓	✓	–	✓	✓
EDM	–	–	✓	✓	✓	✓	✓
Scan Code	–	–	✓	✓	✓	✓	–
Reduced Resolution	–	–	✓	✓	–	✓	–
Fixed Blanking	–	–	✓	✓	✓	✓	–
Integrated Muting	–	–	–	✓	See page 17	–	–
Cascade	–	–	SLPC	–	SLLC	SLSC	–
E-Stop/Safety Switch Connect	–	–	SLPC	–	SLLC	SLSC	–
Brackets Included	–	–	✓	✓	✓	✓	✓
Connection	4-pin Integral Pigtail M12 Included	5-pin Pigtail M12 or 8-pin Pigtail M12 Order separately	8-pin Pigtail M12 Included or order separately	8-pin Pigtail M12 and 12-pin Pigtail M12 Included or order separately	5-pin Pigtail M12 or 8-pin Pigtail M12 Included or order separately	8-pin M12 or 8-pin Pigtail M12 Included (Pigtail)	8-pin M12
<b>Options</b>							
LED on Top	–	–	–	Accessory	Accessory	–	–
Different Housing	–	–	–	–	EZLSA-HTE IP69	Tubular Enclosures IP67	–
Available Finishing	–	–	– Yellow Painted Aluminum – Clear Anodized Aluminum – Nickel-Plated ESD	–	–	– Yellow Painted Aluminum – Clear Anodized Aluminum – Nickel-Plated ESD	–

# Safety Light Curtains – Model Keys

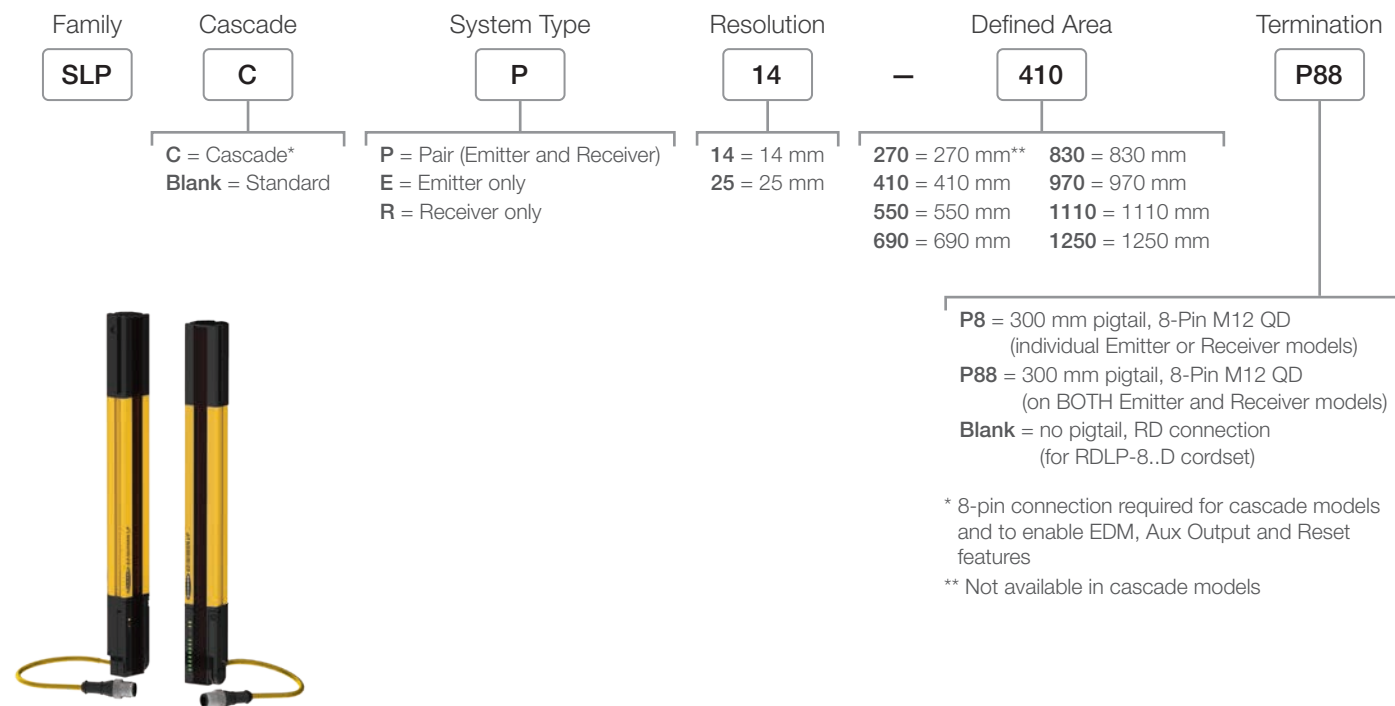
## Compact Type 4: SLC4



## Compact Type 4: EZ-SCREEN LP Basic

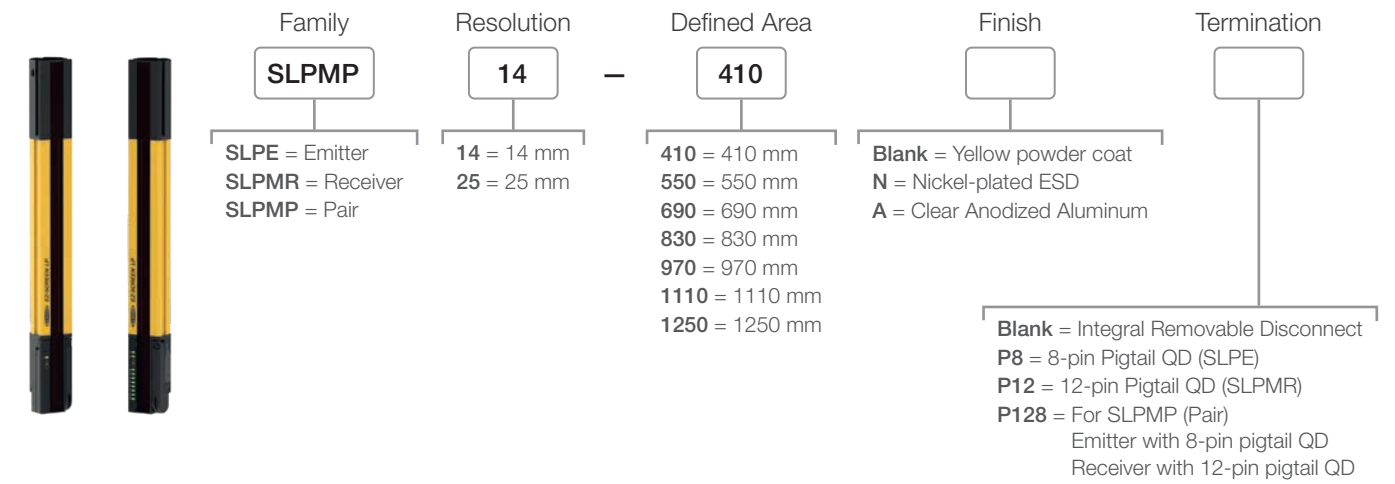


## Compact Type 4: EZ-SCREEN LP

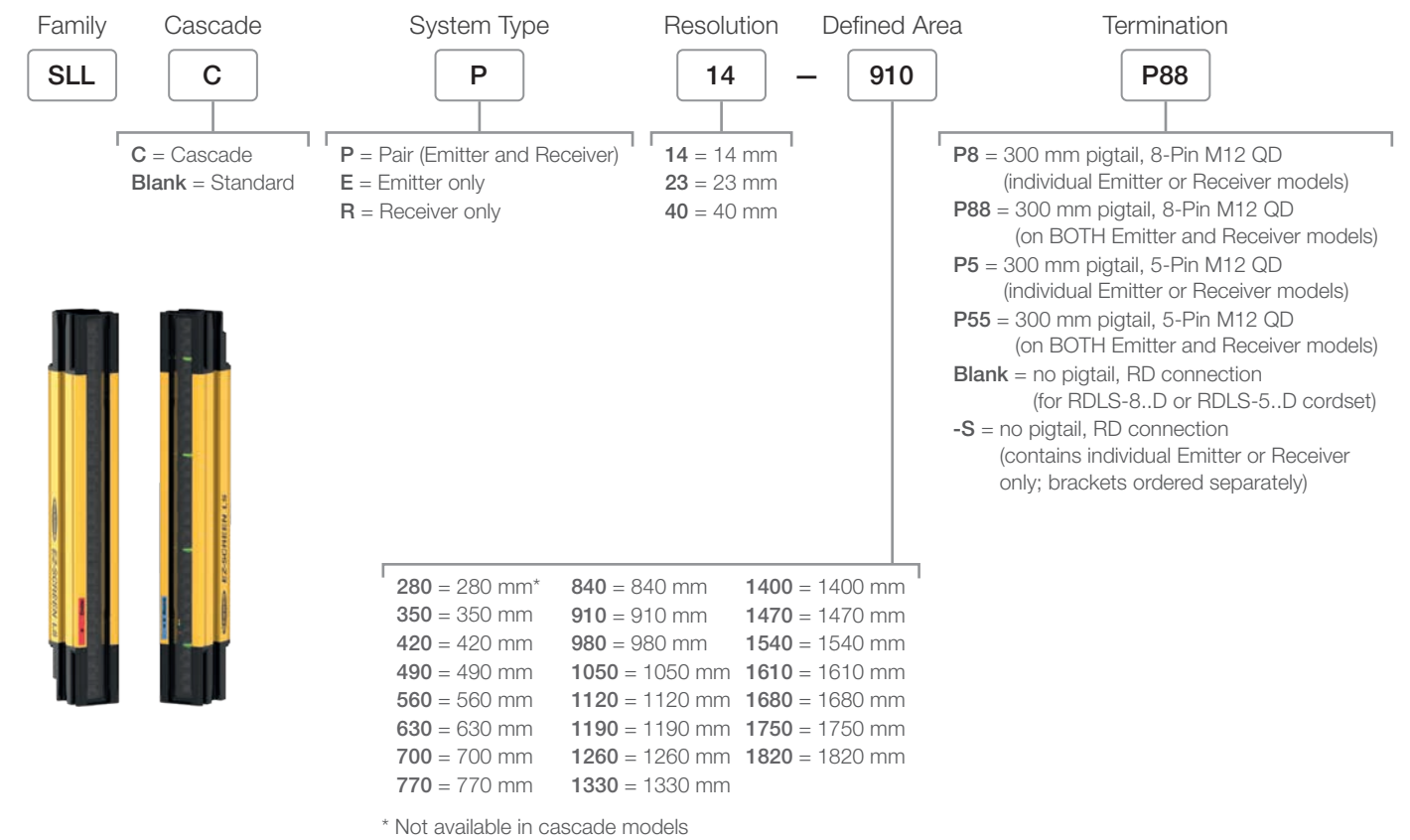


# Safety Light Curtains – Model Keys

## Compact Type 4: EZ-SCREEN LP with Muting

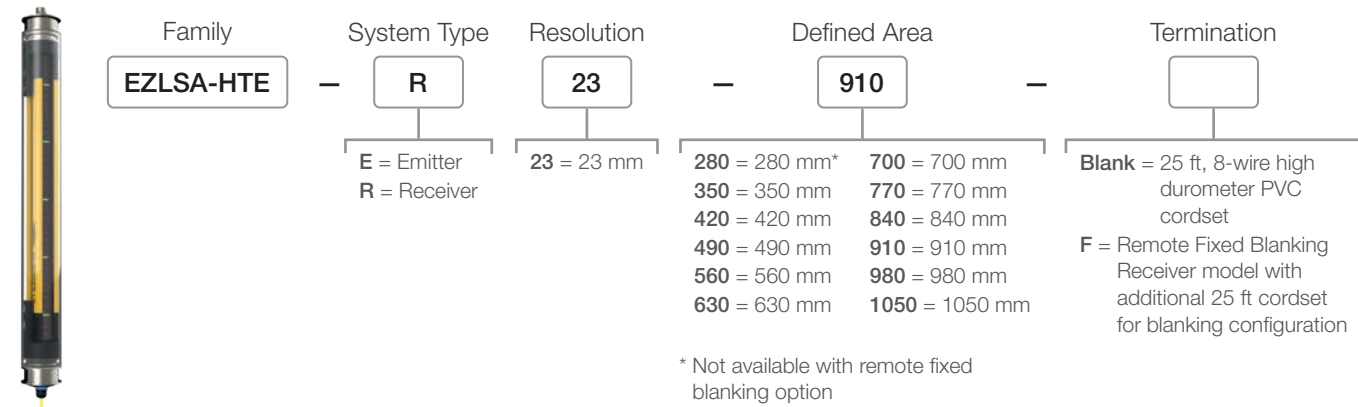


## Heavy-Duty Type 4: EZ-SCREEN LS

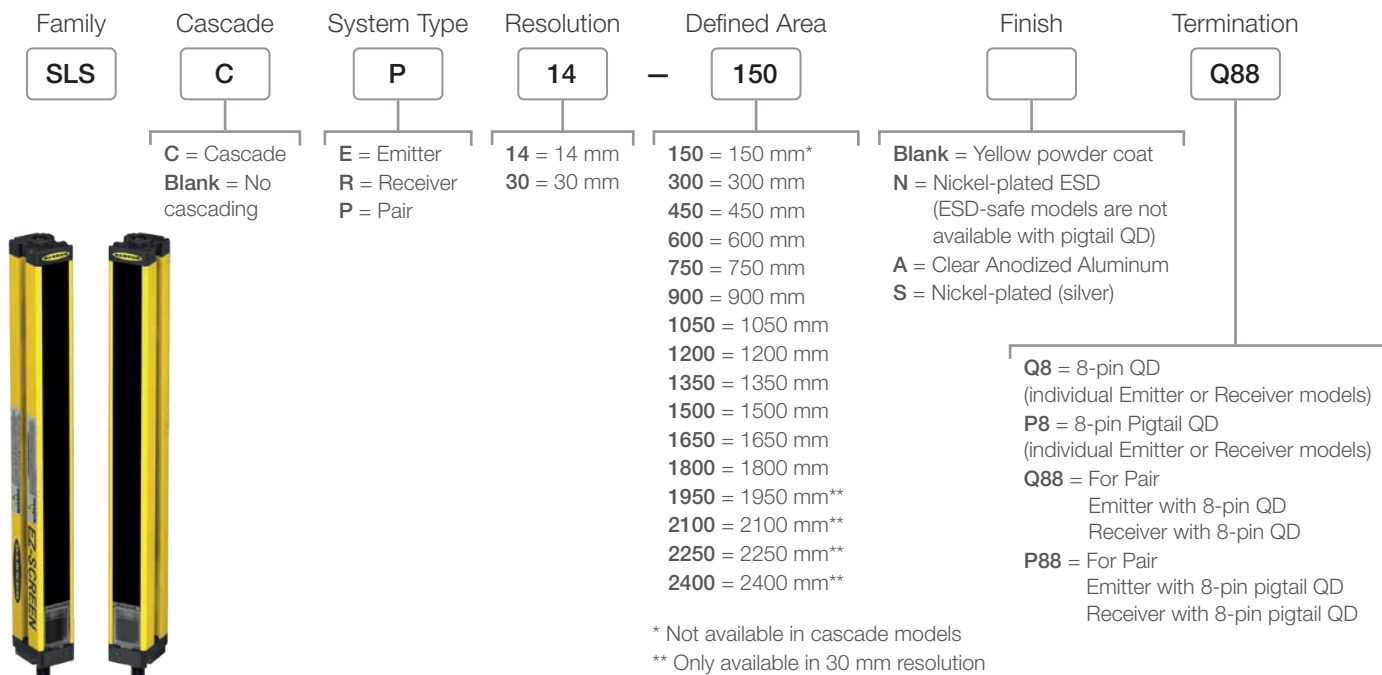


# Safety Light Curtains – Model Keys

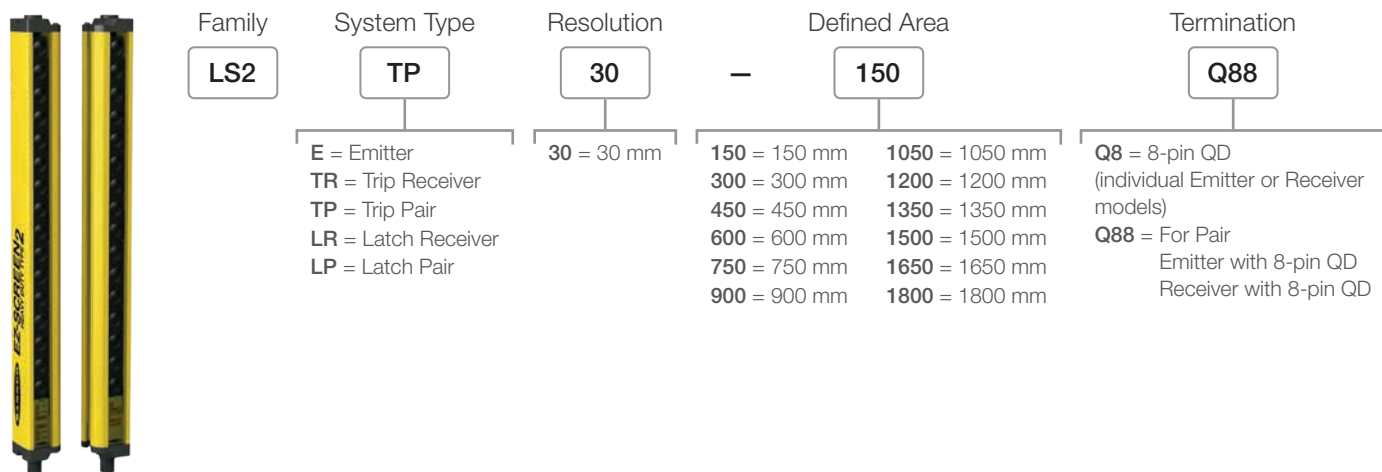
## Heavy-Duty Type 4 IP69 Hygienic: EZ-SCREEN LS



## Heavy-Duty Type 4: EZ-SCREEN



## Type 2: EZ-SCREEN LS2



# Safety Light Curtains – Accessories

## SLC4 Brackets



## LP Brackets



## LS Brackets



## Safety Light Curtains Cables

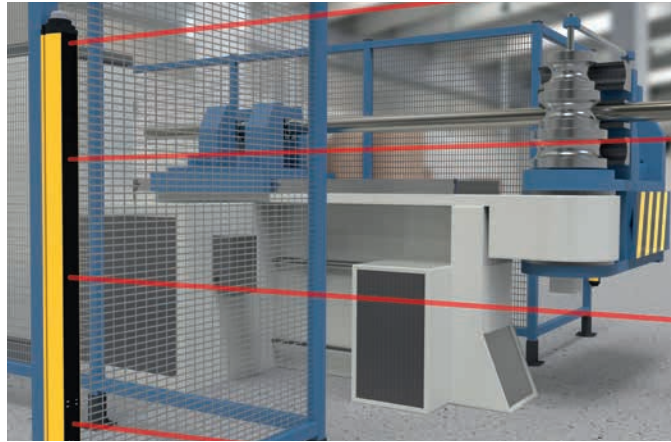
5-Pin M12/Euro-Style		8-Pin M12/Euro-Style	
QDE-515D 4.5 m (15')	QDE-575D 22.8 m (75')	QDE-815D 4.5 m (15')	QDE-875D 22.8 m (75')
QDE-525D 7.6 m (25')	QDE-5100D 30.4 m (100')	QDE-825D 7.6 m (25')	QDE-8100D 30.4 m (100')
QDE-550D 15.2 m (50')		QDE-850D 15.2 m (50')	



# Type 4 Safety Light Grids

Easy-to-use, heavy-duty Type 4 grids for perimeter guarding

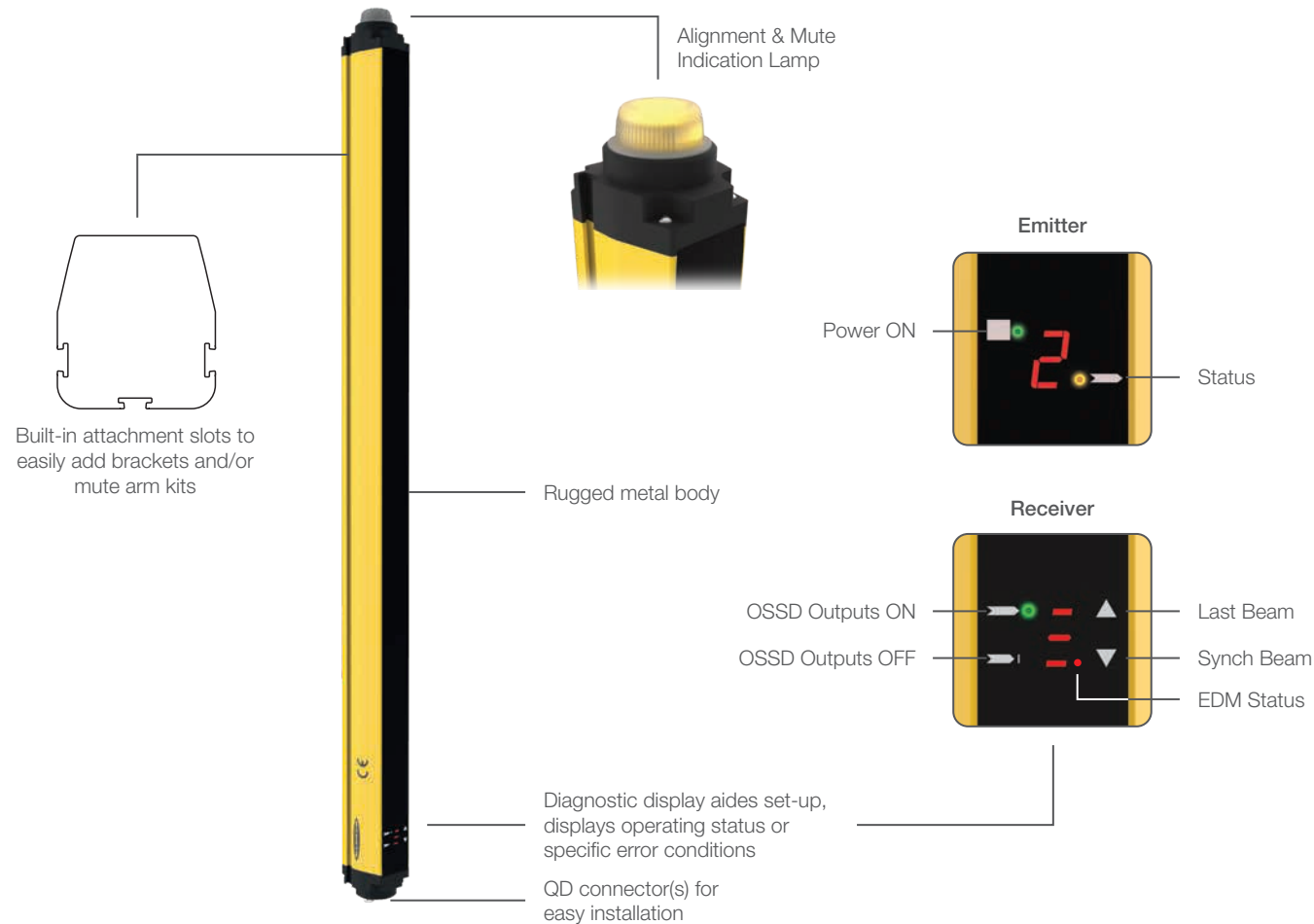
Two to four beam Type 4 safety light grids protect personnel from injury and machines from damage by guarding access, areas, and perimeters. Able to detect a body in a cost-effective and heavy-duty safety light curtain package.



SGS Safety Grid Systems, with two, three, or four beams, are used to monitor the perimeter of the work area.



SGS Safety Grid Systems are available in Emitter/Receiver models capable of safeguarding over very long distances and in easy-to-deploy Active/Passive models.



# Muting Options for Safety Light Grids

Certain SGS models are available with integral muting for specific types of entry/exit applications

Integral Muting allows monitoring of redundant mute device inputs and automatically suspends (mutes) the safeguarding function of a device during the non-hazardous portion of the machine cycle.



Integral muting models have muting technology built into the device eliminating the need for an external muting controller. Preassembled muting arm kits are available in T, L and X configurations. The muting kits use premounted hardware and Q20 retroreflective sensors and reflectors.

## Benefits of Muting

- Maintain high safety standards while allowing for a predetermined object to break a beam
- Limit downtime by not unnecessarily shutting down a conveyor or robot cell

## Applications

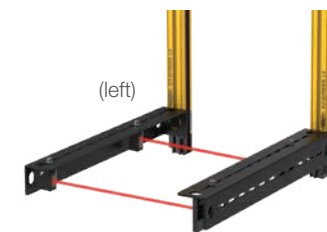
- Assembly and packaging machines
- Automated production equipment
- Robotic work cells
- Automated warehouses
- Palletizers

## Mute Arm Kits

Preassembled (with mounting hardware) for plug-and-play connection to the SGS grid and LS Safety Light Curtains

- Wiring connection block or cable accessories available
- Adjusts easily for line changes

### L-Configuration



#### SGSA-ML-L-LPQ20

- Includes 2 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors



#### SGSA-ML-R-LPQ20

- Includes 2 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors

### T-Configuration



#### SGSA-MT-LPQ20

- Includes 4 mute arms, 4 SGSA-Q20PLPQ5 mute sensors, and 4 retroreflectors

### X-Configuration



#### SGSA-MX-LPQ20

- Includes 4 mute arms, 2 SGSA-Q20PLPQ5 mute sensors, and 2 retroreflectors



# SGS Selection

Choose your safety light grids for perimeter guarding.

- 2, 3 & 4 beam Emitter/Receiver models with a broad feature set
- 2, 3 & 4 beam easy-to-deploy Active/Passive models, only require wiring to the active side



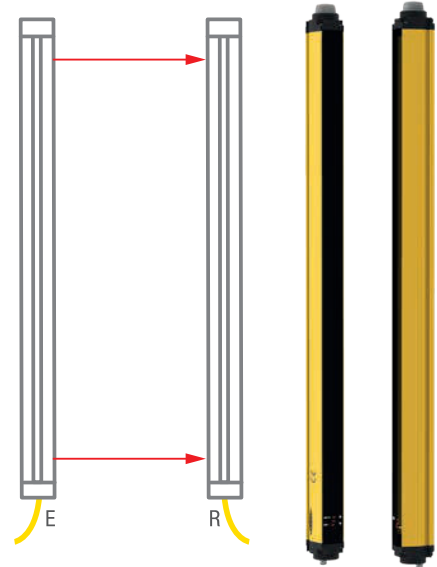
## Perimeter Guarding Type 4

	SGS Active/Passive Use with SGSB	SGS Emitter/ Receiver	SGS Long Distance	SGS Active/Passive with Muting Use with SGSB	SGS Emitter/ Receiver with Muting	SGS Mirror Use with SGSSA/SGSMA
Body Detection						
Muting						
Family	SGSSA	SGSSP	SGSXP	SGSMA	SGSMP	SGSB
Type IEC 61496-1, -2	Type 4	Type 4	Type 4	Type 4	Type 4	/
Safety Rating EN ISO 13849-1; IEC 61508; IEC 62061	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	Category 4 PL e; SIL3; SIL CL3	/
Dimensions W x D (mm)	52 x 56.9	52 x 56.9	52 x 56.9	52 x 56.9	52 x 56.9	52 x 56.9
Unit Type	Active/Passive	Emitter/Receiver	Emitter/Receiver	Active/Passive	Emitter/Receiver	Mirror Assembly
Max Sensing Range (m)	0.5 to 8 m (6.5 m <sup>2</sup> )	0.5 to 30 m	6 to 60 m	0.5 to 8 m (6.5 m <sup>2</sup> )	0.5 to 30 m	/
Number of Beams	2/3/4	2/3/4	2/3/4	2/3/4	2/3/4	2/3/4
Beam Spacing	300 <sup>†</sup> /400/500 mm	300/400/500 mm	300/400/500 mm	300 <sup>†</sup> /400/500 mm	300/400/500 mm	300/400/500 mm
<b>Functions</b>						
Reset	✓	✓	✓	✓	✓	/
EDM	✓	✓	✓	✓	✓	/
Scan Code	-	✓	✓	-	✓	/
Integrated Muting	-	-	-	✓	✓	/
Integrated Muting Lamp	-	-	-	✓	✓	/
Override Input	-	-	-	✓	✓	/
Connection	8-pin M12	8-pin M12	8-pin M12	12-pin M12 and 5-pin M12 for muting sensors	E: 8-pin M12 R: 12-pin M12 E & R: 5-pin M12 for muting sensors	/
<b>Options</b>						
Brackets	✓	✓	✓	✓	✓	✓
Muting Arms	-	-	-	✓	✓	✓

# Safety Light Grids – Model Keys

## SGS Emitter/Receiver

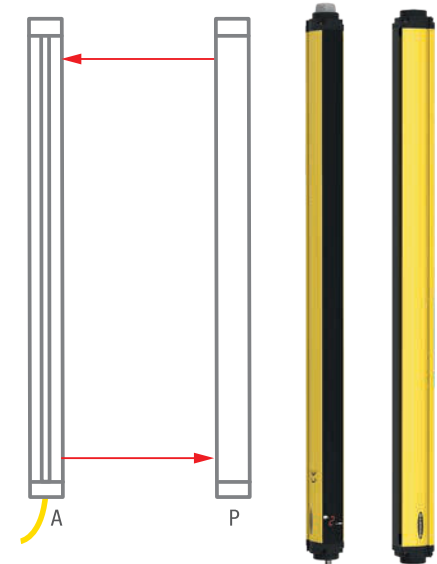
- When compared to higher resolution light screens, a lower cost option for body detection applications
- Available with integral muting
- Long range, up to 60 m



Type	Protective Height (mm)	Range (m)	Integral Muting	Model
Emitter & Receiver	500 (2 beams)	6 to 60	No	SGSXP2-500Q88
	800 (3 beams)			SGSXP3-400Q88
	900 (4 beams)			SGSXP4-300Q88
	1200 (4 beams)			SGSXP4-400Q88
Emitter & Receiver	500 (2 beams)	0.5 to 30	No	SGSSP2-500Q88
	800 (3 beams)			SGSSP3-400Q88
	900 (4 beams)			SGSSP4-300Q88
	1200 (4 beams)			SGSSP4-400Q88
Emitter & Receiver	500 (2 beams)	0.5 to 30	Yes	SGSMP2-500Q128
	800 (3 beams)			SGSMP3-400Q128
	900 (4 beams)			SGSMP4-300Q128
	1200 (4 beams)			SGSMP4-400Q128

## SGS Active/Passive

- Active transceiver contains emitter and receiver
- Reduces overall wiring costs
- Available with integral muting
- Up to 8 m range





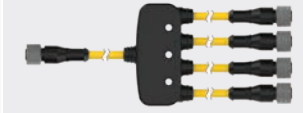
Type	Protective Height (mm)	Range (m)	Integral Muting	Model
Active Transceiver	500 (2 beams)	0.5 to 8	No	SGSSA2-500Q8
	800 (3 beams)			SGSSA3-400Q8
	900 (4 beams)			SGSSA4-300Q8
	1200 (4 beams)			SGSSA4-400Q8
Active Transceiver	500 (2 beams)	0.5 to 8	Yes	SGSMA2-500Q12
	800 (3 beams)			SGSMA3-400Q12
	900 (4 beams)			SGSMA4-300Q12
	1200 (4 beams)			SGSMA4-400Q12
Passive Mirror				
Type	Protective Height (mm)	Range (m)	Model	
Passive Mirror Assembly	500 (2 beams)	Pair with Active Transceivers with matching beams and protective heights	SGSB2-500	
	800 (3 beams)		SGSB3-400	
	900 (4 beams)		SGSB4-300	
	1200 (4 beams)		SGSB4-400	

# Safety Light Grids – Accessories

## Connection Options

8-Pin M12/Euro-Style			12-Pin M12/Euro-Style	
QDEG-815D 4.5 m (15')	QDEG-875D 22.8 m (75')		QDEG-1215E 4.5 m (15')	QDEG-1275E 22.8 m (75')
QDEG-825D 7.6 m (25')	QDEG-8100D 30.4 m (100')	QDEG-1225E 7.6 m (25')	QDEG-12100E 30.4 m (100')	
QDEG-850D 15.2 m (50')		QDEG-1250E 15.2 m (50')		

## Mute Connection Options

Model	Description	
SGSA-MCB	Connection box for X, L or T mute arm kits	
SGSA-MCS-2	Connection cable for X and L mute arm kits	
SGSA-MCS-4	Connection cable for T mute arm kits	
SGSA-MCB-HW	Optional hardware kit for mounting mute connection box, or mute connection cable to the t-slot of SGS Receiver or Active Unit	

## Bracket



## Stands and Corner Mirrors



### SGSA-S Series Enclosures

Enclosure Model	Fits SGS Models	# of Windows	Enclosure Height	Distance from Floor to Bottom Window	Distance between Beams
SGSA4-S300	SGS..4-300Q..	4	1543 mm (60.75")	300 mm (11.8")	300 mm (11.8")
SGSA4-S300-M					
SGSA3-S400	SGS..3-400Q..	3	1238 mm (48.78")	300 mm (11.8")	400 mm (15.8")
SGSA3-S400-M					
SGSA4-S400	SGS..4-400Q..	4	1618 mm (63.69")	300 mm (11.8")	400 mm (15.8")
SGSA4-S400-M					
SGSA2-S500	SGS..2-500Q..	2	1035 mm (40.75")	400 mm (15.8")	500 mm (19.7")
SGSA2-S500-M					

### SSM Series Corner Mirrors

Mirror Model	Fits SGS Models	Reflective Area	Mounting Area	Mirror Height
SSM-550	SGS..2-500..	550 mm (21.7")	661 mm (26.0")	628 mm (24.7")
SSM-825	SGS..3-400..	825 mm (32.5")	936 mm (36.9")	903 mm (35.6")
SSM-975	SGS..4-300..	975 mm (38.4")	1086 mm (42.8")	1053 mm (41.5")
SSM-1275	SGS..4-400..	1275 mm (50.2")	1386 mm (54.6")	1353 mm (53.3")

### MSA Series Stands

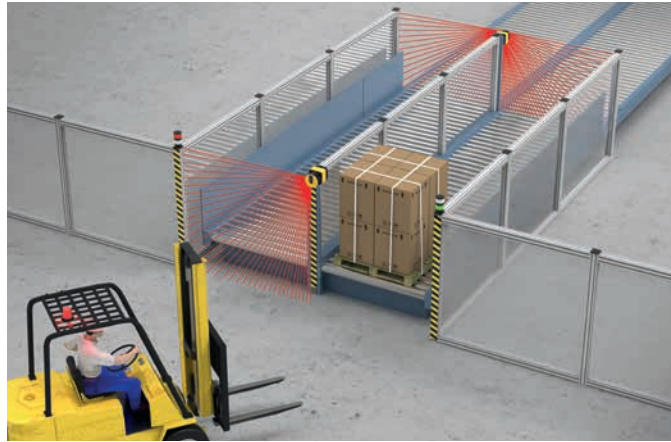
Stand Model	Pole Height	Usable Stand Height
MSA-S66-1	1676 mm (66")	1550 mm (61")
MSA-A84-1	2134 mm (84")	2007 mm (79")
MSA-S105-1	2667 mm (105")	2667 mm (100")



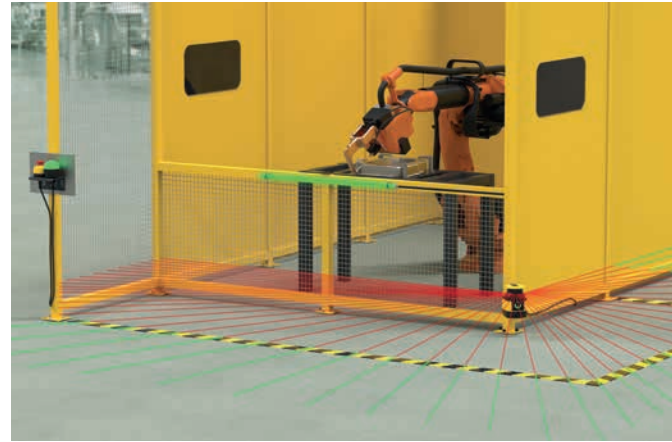
# Safety Scanner System

Horizontal or vertical monitoring of both personnel and stationary or mobile systems

SX Series safety laser scanners protect personnel, equipment, and mobile systems by continuously scanning a user-defined area of up to 275° to create a two-dimensional protected zone.



SX5 software configuration allows for Zone switching for FULL, RIGHT-SIDE and LEFT-SIDE Safety Protection during this forklift access application.

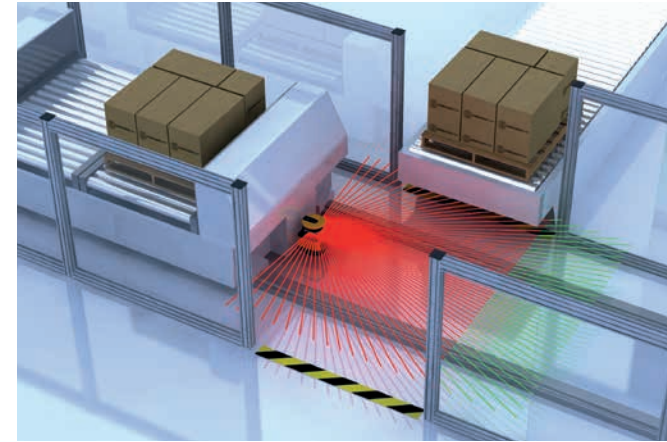


Software interface makes it easy to create custom safety and warning zones to safeguard large, complex, and irregularly shaped areas.

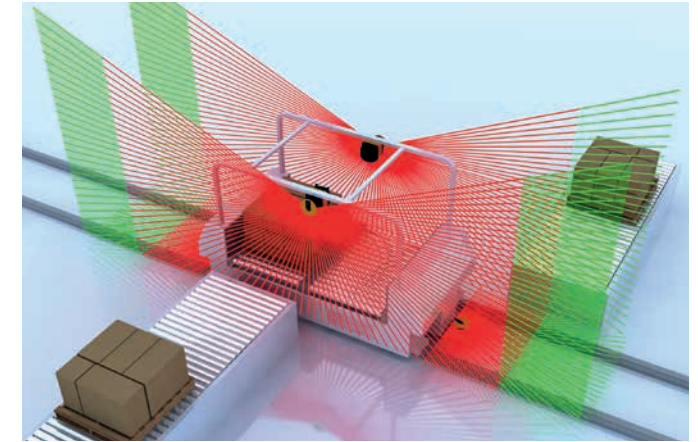
# Safety Scanner System

Increased Machine Uptime

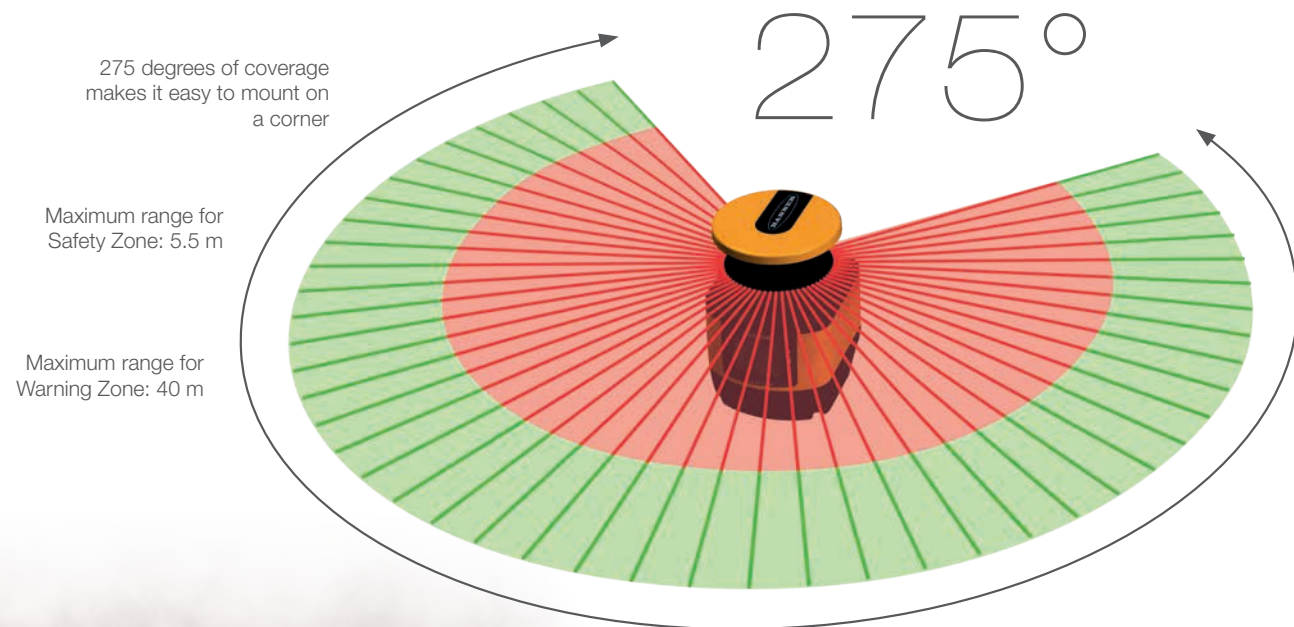
The SX5-B has on-board LED indicators and a large multi-segment color display that provide at-a-glance system status information so users can quickly identify zone breaches and resolve issues with a minimal amount of equipment



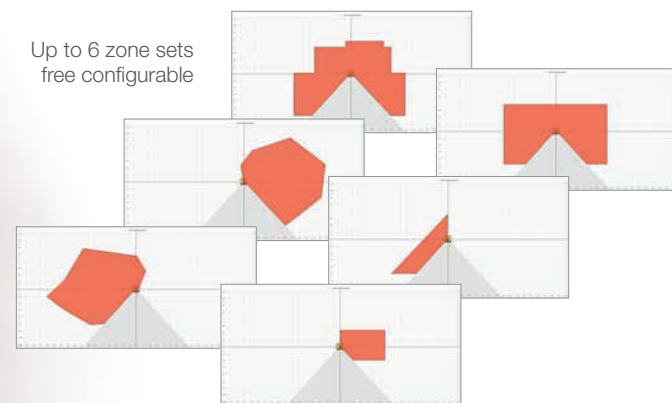
Compact, one-piece safety device installs easily above and away from area hazards without requiring time-consuming alterations to area infrastructure.



An alert is triggered if an object enters the warning zone and equipment will come to a stop if the safety zone is breached.



Light Immune and dust resistant – Best-in-class



Up to 6 zone sets free configurable



Rugged design for reliable industrial use

27 different status, diagnostic, warning and error displays

Dynamic Muting available and selectable detection capability for vertical applications



LED 1: Object Detection in Safety Zone (OSSD)  
LED 2: Not Available  
LED 3: Assigned to Warning Zone 2  
LED 4: Assigned to Warning Zone 1  
LED 5: Interlock Status (waiting for Reset)

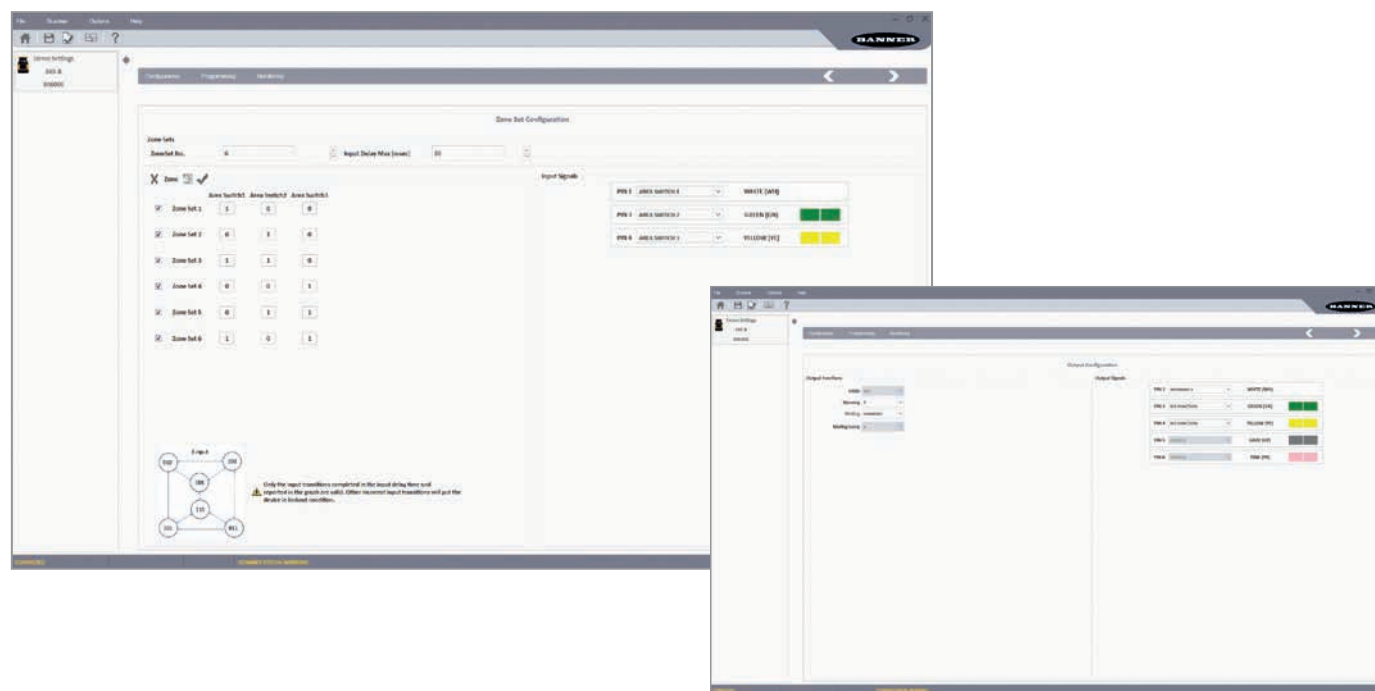
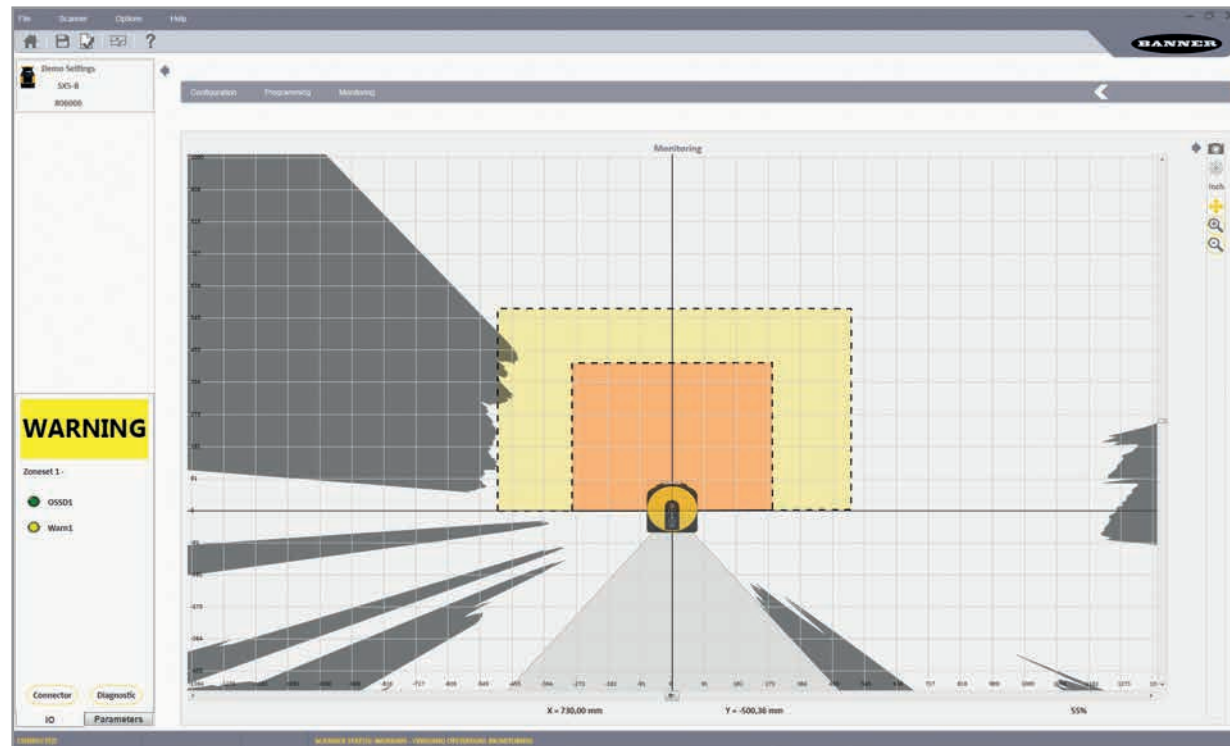




# Safety Scanner System – Software

## Simple Setup for Rapid Deployment

The SX5-B can be set up in just a few simple steps using Banner's free configuration software. This robust software features menu-driven tools that guide users through setup and make it easy to design custom safety and warning zones to accommodate existing infrastructure and meet the specific needs of any application.



The software displays a graphic rendering of the monitored area, and provides configuration and management tools, such as drop-down menus, function-specific worksheets...

- Administrative data: file title header, application description and more
- Safety-relevant data: startup process information
- Safety Zone or Warning Zone configuration data: contours and limits



# Safety Scanner System – Models and Accessories

## SX Series Safety Scanners



Model	Protective Field Range	Warning Field Range	Scanning Angle	Dimensions H x W x D (mm)	Features
SX5-B	0.05 m to 5.5 m	40 m	275°	152 x 112.5 x 102	LCD Display, Muting

## SX Series Safety Scanners Specifications

<b>Detection Capability</b>	40 mm, 70 mm	<b>Current Consumption (24V dc)</b>	No output load: 0.3A at 24V dc With maximum output load: 1.1A at 24V dc
<b>OSSD (Safety Outputs)</b>	2 OSSD All inputs and outputs are protected from short circuits to +24V dc or dc common	<b>Mechanical Data</b>	Housing material: Aluminum Alloy Housing color: Yellow RAL1003 Optics cover material: PC Optics cover surface: Acrylic
<b>Zone Sets</b>	Six	<b>Safety Data</b>	Type 3 (EN 61496-1) SIL 2 (IEC 61508) Category 3 (EN ISO 13849-1) SIL CL 2 (EN 62061) PL d (EN ISO 13849-1)
<b>Environmental Rating</b>	IEC IP65	<b>Optical Data</b>	Wavelength: 905 nm Pulse duration: 3 nsec Laser class: CLASS 1 (EN 60825-1)
<b>Operating Conditions</b>	0° C to +50° C (+32° F to +122° F) 95% maximum relative humidity (non-condensing)	<b>Certifications</b>	  LISTED

## SX Series Safety Scanners Brackets



SXA-MBK-1

- Pitch and roll angle adjustment bracket
- Bracket memory feature allows for fast scanner swap out



SXA-MBK-2

- Protection bracket



## SX Series Safety Scanners Cables

### 8-Pin M12/Euro-Style Straight connector

SXA-815D	SXA-850D
4.5 m (15')	15.2 m (50')
SXA-825D	SXA-8100D
7.6 m (25')	30.4 m (100')



### 4-Pin M12 D-Code to RJ45 Double ended

STP-M12D-406	STP-M12D-430
1.83 m (6')	9.14 m (30')
STP-M12D-415	
4.5 m (15')	



# Safety Relays and Safety Controllers

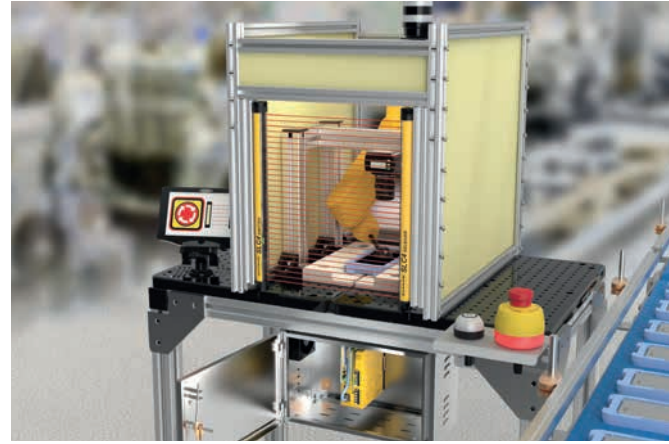


Industrial safety controllers and relays provide an interface between safety devices and the machines and processes those devices monitor for a complete and easy-to-use safety control solution.

Safety Relays



- Cost-effective for simple safety circuits
- Preset Functionality: Configuration not required
  - Safety Inputs: 1
  - Independently controlled Safety Outputs: 1; 4 to 7A

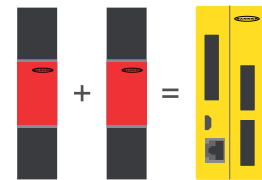


Safety controllers can be tailored for a wide variety of machines, including machines with multiple processes.

Hybrid Safety Controller plus 2 Safety Relays

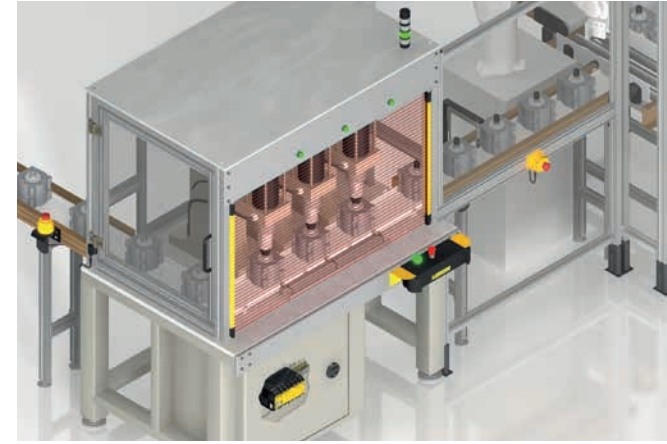


- Flexible and cost-effective solution for machines typically using 2 Safety Relays
- PC Configurable: Flexible and easy-to-use
  - Safety Inputs: up to 10; up to 70 with ISD
  - Independently controlled Safety Outputs: 2; 6A each
  - Convertible Safety Inputs: 4
  - Terminal LEDs for easy troubleshooting
  - Industrial Ethernet



- Connect safety devices easily to the safety controller
- Universal input safety relays
  - E-Stop monitoring safety relays
  - Muting safety relays
  - Safe speed monitoring relays
  - Safety mat relays
  - Safety extension relays

# Safety Relays and Safety Controllers

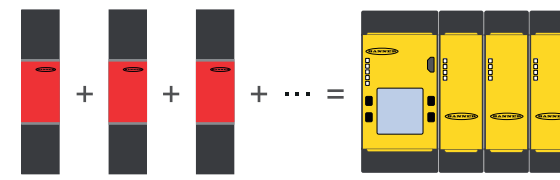


Configurable controllers monitor multiple safety devices, such as E-stop buttons, safety switches, safety light screens, two-hand controls and rope pull switches.

Expandable Safety Controller



- Expandable for Complex Safety applications where 3 or more safety relays are typically used
- PC Configurable: Flexible and easy-to-use
  - Safety Inputs: 26 (base unit) up to 154
  - Independently controlled Safety Outputs: up to 68; 0.5A to 6A each
  - Convertible Safety Inputs: 8 (Base Unit) up to 40
  - LCD Display for easy troubleshooting
  - Industrial Ethernet

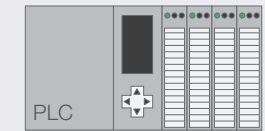


## In-Series Diagnostics (ISD)

- Easy-to-Implement
- Diagnostic Capabilities for Complex Safety Systems



In-Series Diagnostics (ISD) makes it easy to access diagnostic data from devices in a safety system without special equipment or designated cabling. Users can troubleshoot machine safety systems, prevent system faults, and reduce equipment downtime.



EtherNet/IP





# Relay and Controller Selection

Choose a safety relay or safety controller.

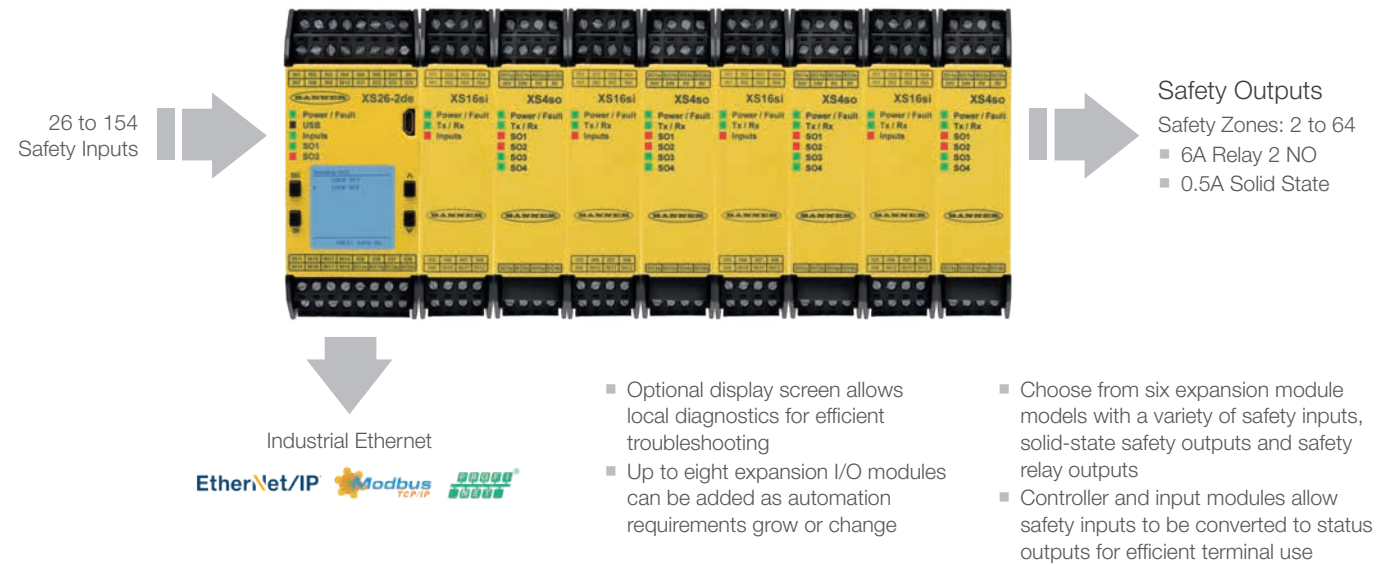
- Configurable (expandable) safety controllers
- Preconfigured safety relay modules



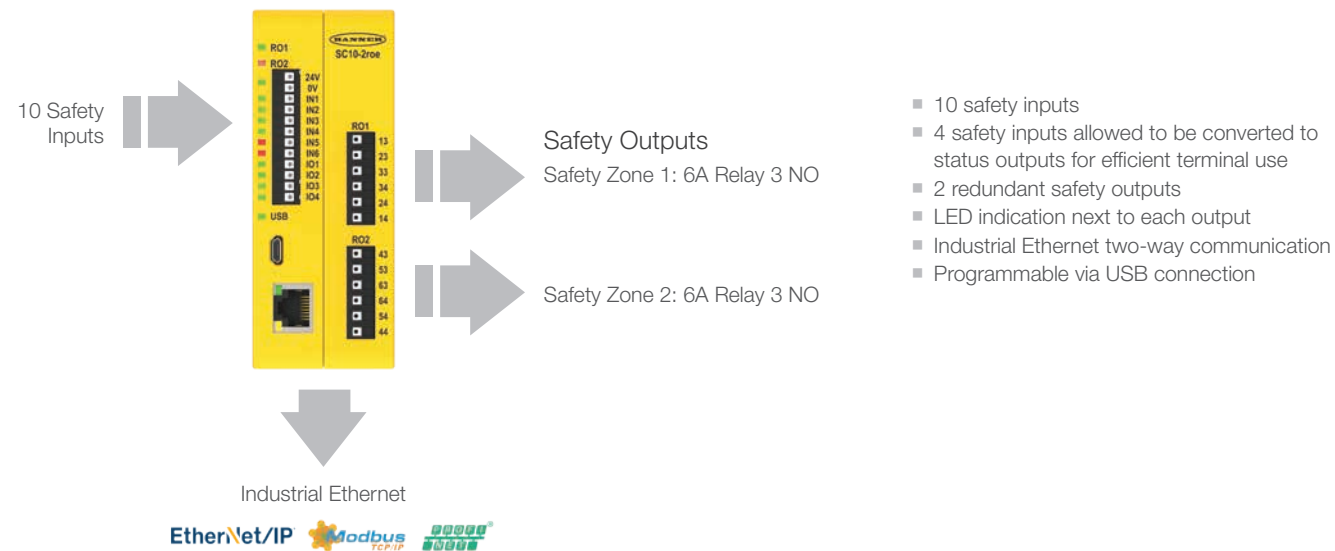
		Preconfigured Safety Relay Modules									Configurable Controllers		
		GM/ES	UM	SM	AT	MMD	SSM	SR	IM	EM	SC10	SC26/XS26	
Self Testing Safety Device			✓			✓					✓	✓	
Self Testing Safety Device with EDM Function			✓			✓		✓	✓		✓	✓	
E-Stop		✓	✓			(secondary function) ✓					✓	✓	
Rope Pull		✓	✓			(secondary function) ✓					✓	✓	
Gate Switch (potential free contacts)		✓	✓			✓					✓	✓	
RFID Gate Switch (OSSD contacts)			✓			✓					✓	✓	
ISD Functionality											✓		
Safety Mat Monitoring				✓							✓	✓	
Two-Hand Control					✓						✓	✓	
Enabling Device		✓	✓								✓	✓	
Expandable										✓		✓	
Muting						✓					✓	✓	
ON/OFF Delay										OFF Delay available	✓	✓	
Speed Monitoring							✓						
Safety Standard		Cat. 4 PL e, per EN ISO 13849-1; SIL 3 per IEC 61508 and IEC 62061											
Inputs		1 NC & 1 NO (single or dual) 1 NC (single) 2 NC (dual)	1 NC (single) or 2 NC (dual) or 2 PNP		1 (or multiple in series) 4-wire safety mat	2 STB or buttons with complementary contacts	2 NC muteable (dual) & 2 NC SSI (dual)	2 PNP	2 NC (dual) or 2 PNP	2 NC (dual) or 2 PNP	1 NC (single) or 2 NC (dual)	10	SC26: up to 26 XS26: up to 154
Safety Outputs		2 NO / 3 NO / 4 NO	3 NO or 2 NO		4 NO	2 NO	2 PNP OSSD or 2 NO	2 NO	2 NO / 3 NO	2 NO / 3 NO	4 NO or 4 NO with delay	2x 3 NO	SC: 2 XS: up to 68
Maximum Safety Output Rating		6A / 7A	7A		6A	6A	6A	4A	6A	6A	6A	6A each	0.5A each
Auxiliary Outputs		1 NC or 1 NC & 2 PNP	1 NC, depending on model		1 NC & 2 PNP	/	1 PNP or 1 NC	1 NC	1 NC	1 NC, depending on model	/	depending on configuration	depending on configuration
Power Supply		24V ac/dc 115V ac & 12-24V dc or 230V ac & 12-24V dc	24V ac/dc		115V ac & 12-24V dc or 230V ac & 12-24V dc	24V ac/dc	24V dc	24V dc	24V dc	24V dc	24V dc or 24V ac/dc, depending on model	24V dc	24V dc

# Safety Controllers

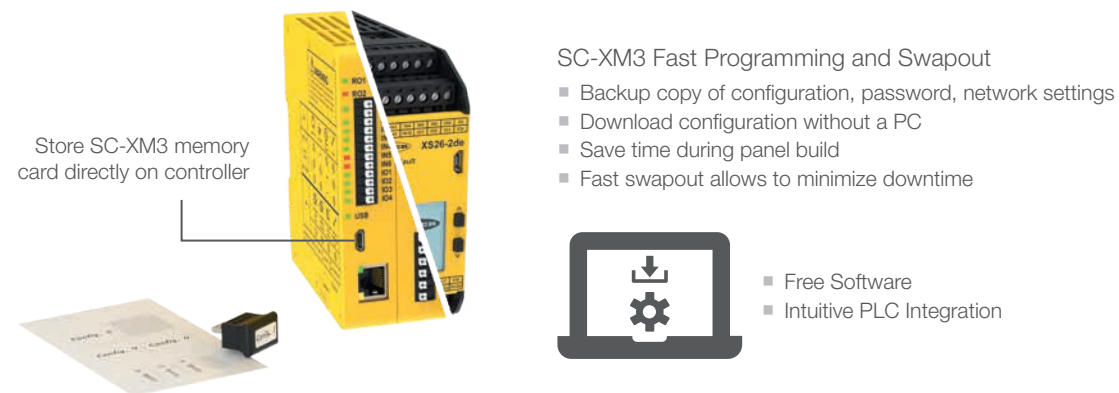
## XS26 Expandable Safety Controller



## SC10 Safety Controller

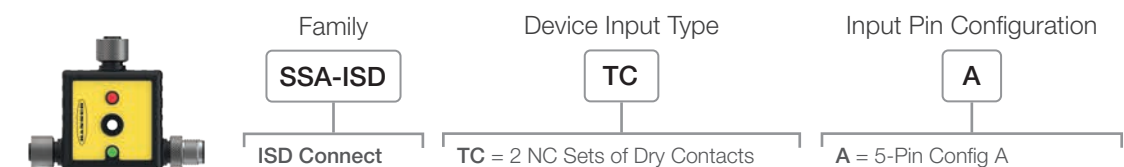
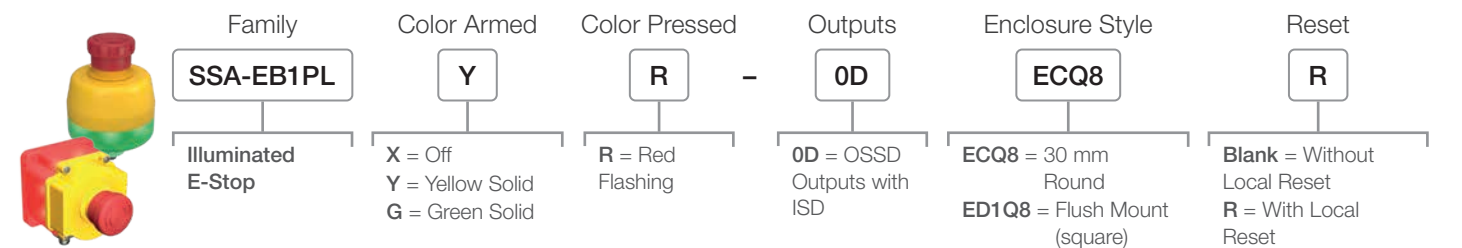
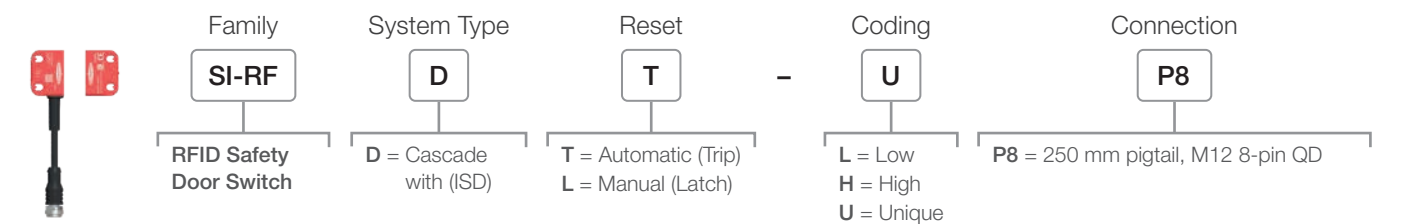
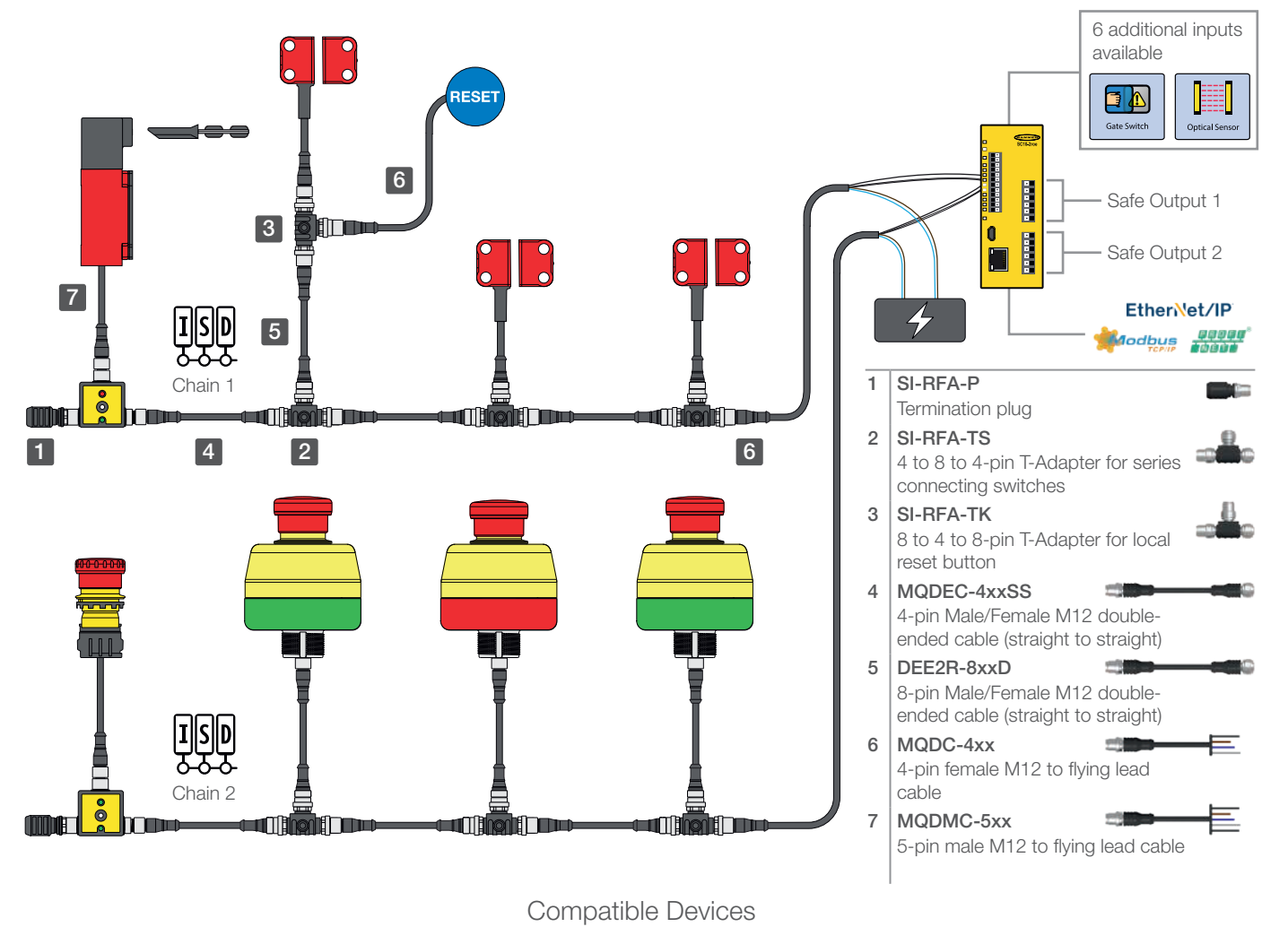


## Easy to Configure and Integrate with a PLC



# In-Series Diagnostics Functionality

In-Series Diagnostics allows you to connect up to 32 devices with one in-series connection and communicate directly with the most commonly used PLCs. Achieves up to CAT4, SIL3, PLe safety rating.





# Build System and Select Equipment

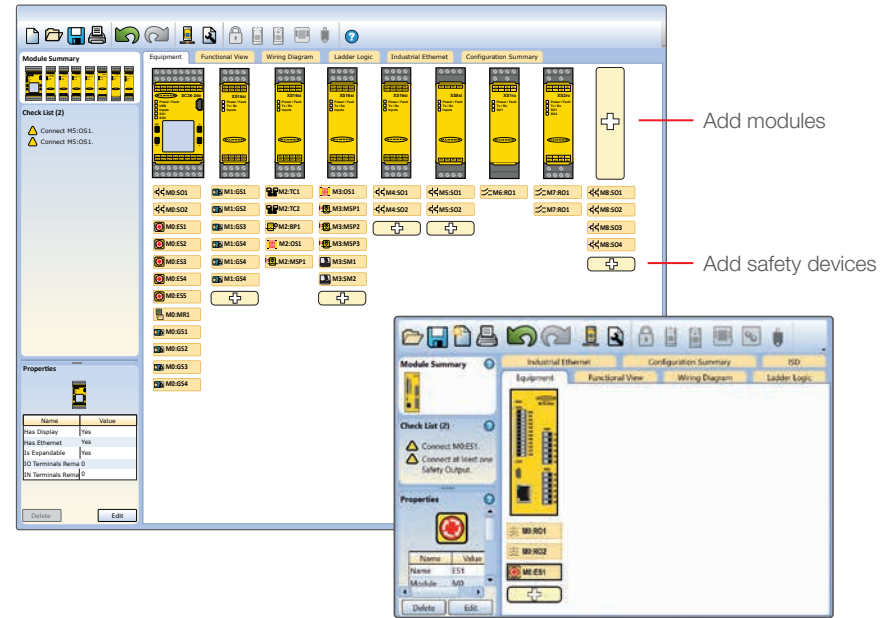
The feature-rich SC10 and SC/XS26 safety controller software provides a seamless user interface for setting up and managing safety systems. The software features an intuitive icon-based, drag-and-drop user interface to reduce the learning curve and speed up commissioning.

- Complex configurations made easy
- Simulate configurations before implementation
- Auto configure Industrial Ethernet for remote monitoring and diagnostics

## 1. Choose Controller



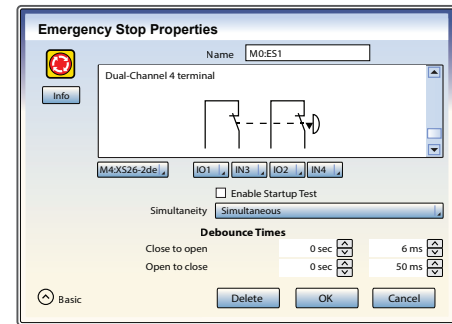
## 2. Equipment View



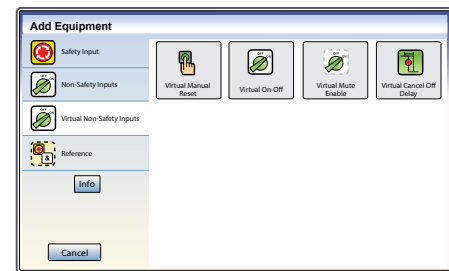
## 3. Add safety devices



## 4. Select safety device properties

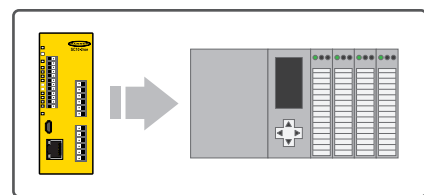


## 5. Add virtual non-safety inputs

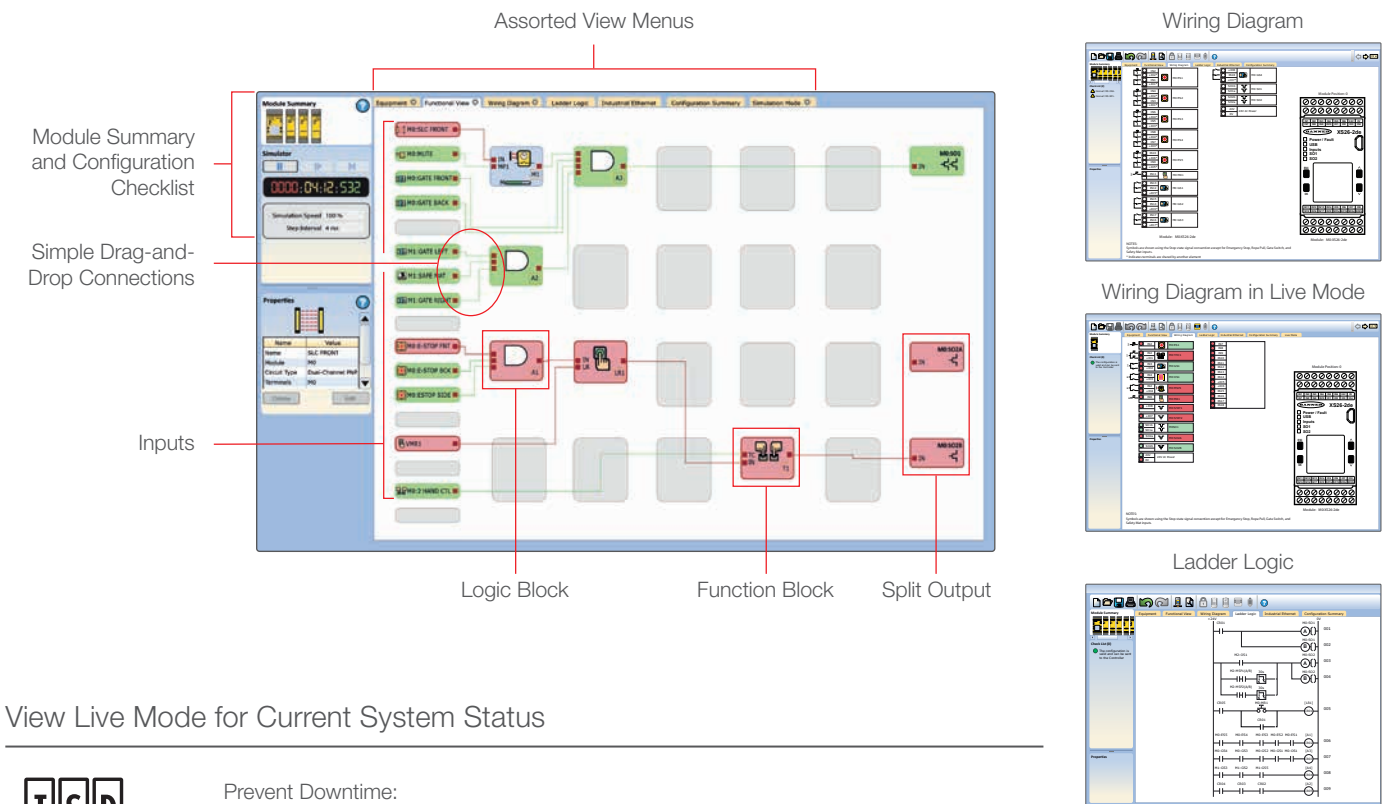


## Intuitive setup and PLC integration

- Expedite PLC Integration with Tag Export Feature
- Eliminates error-prone manual entries
- Import tags to PLC via .csv or .xml files
- Defines actionable In-Series Diagnostic data within the PLC
- For more information visit



# Configure your system in minutes



## View Live Mode for Current System Status

Prevent Downtime:

**Marginal** Alert to check Door 1 for misalignment before it causes downtime

**Warning** Alert to check E-Stop 1 for low voltage before it causes downtime

Terminator Plug	Name	Status	Alert	Actuator
1	Door 1	On	Marginal	Detected
2	Door 2	Off	Warning	Fault
3	Door 3	Off	Warning	Fault
	MDChain 1	Off	Warning	Fault
	MDChain 2	Off	Warning	Fault

Chain:1	Device:1	Close
Expected Code	9D1A	
Received Code	9D1A	
Internal Temperature	75 C	
Actuator Distance	13.8 mm	
Supply Voltage	21.5 V	
Output 1	False	
Output 2	False	
Actuator Detected	True	
Wrong Actuator	False	
Marginal Range	True	
Input 1	False	
Input 2	False	
Local Reset Expected	False	
Output Error	False	
Safety Input Fault	False	
ISD Data Error	False	
Operating Voltage Error	False	
Power Cycle Required	False	
Operating Voltage Warning	False	
Sensor Not Paired	False	
Device	Door Switch	
Expected Code	9D1A	
Received Code	9D1A	
Teach-ins Remaining	0	
Number of Voltage Errors	0000	
Output Switch-off Time	001F	
Range Warning Count	003A	
Expected Company Name	0006	
Received Company Name	0006	
Internal Error A	0000	
Internal Error B	0000	
Local Reset Limit	False	
High Coding Level	True	
Cascadable	True	
Fault Tolerant Outputs	True	

Troubleshooting Made Easy:

Terminator missing

Actuator not taught

Up to 32 ISD safety devices in any order per chain

Reduce Downtime:


Local operator guidance to activated E-Stop

Additional uses for ISD



- Rotation/Indexing
- Tool Identification
- Position Verification

# Safety Relays – Models



## E-Stop and Guard Safety Modules

Model	Supply Voltage	Inputs	Safety Outputs	Aux. Outputs	Output Rating	Output Response Time
 GM-FA-10J	24 V ac/dc	1 NC & 1 NO (single or dual)	2 NO	–	6 A	35 ms
 ES-FA-9AA	24 V ac/dc	1 NC (single) or 2 NC (dual)	3 NO	–	6 A	25 ms
 ES-FA-11AA	24 V ac/dc	1 NC (single) or 2 NC (dual)	2 NO	1 NC	7 A	25 ms
 ES-FA-6G	24 V ac/dc	1 NC (single)	3 NO	1 NC	6 A	35 ms
 ES-UA-5A	115 V ac & 12-24 V dc	1 NC (single) or 2 NC (dual)	4 NO	1 NC & 2 PNP	6 A	25 ms
 ES-VA-5A	230 V ac & 12-24 V dc	1 NC (single) or 2 NC (dual)	4 NO	1 NC & 2 PNP	6 A	25 ms



## Universal Safety Input Modules

Model (24 V ac/dc)	Inputs	Safety Outputs	Aux. Output	Output Rating	Output Response Time
 UM-FA-9A	1 NC (single) or 2 NC (dual) or 2 PNP	3 NO	–	6 A	25 ms
 UM-FA-11A	1 NC (single) or 2 NC (dual) or 2 PNP	2 NO	1 NC	7 A	25 ms



## Safety Mat Monitoring Modules

Model	Supply Voltage	Inputs	Safety Outputs	Aux. Outputs	Output Rating	Output Response Time
 SM-GA-5A	115 V ac & 12-24 V dc	1 (or multiple in series) 4-wire Safety Mat	4 NO	1 NC & 2 PNP	6 A	50 ms
 SM-HA-5A	230 V ac & 12-24 V dc	1 (or multiple in series) 4-wire Safety Mat	4 NO	1 NC & 2 PNP	6 A	50 ms




## Muting Modules

Model (24 V dc)	Input Device	Inputs	Safety Outputs	Aux. Outputs	Output Rating	Output Response Time
 MMD-TA-12B	Electromechanical & Solid State	2 NC Muteable (dual) & 2 NC SSI (dual)	2 PNP OSSD	1 PNP	0.5 A	10 ms
 MMD-TA-11B	Electromechanical & Solid State	2 NC Muteable (dual) & 2 NC SSI (dual)	2 NO	1 NC	6 A	20 ms

## Safe Speed Monitoring Modules




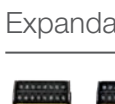

Model	Supply Voltage	Inputs	Safety Outputs	Aux. Outputs	Ranges (lpm)	Output Rating
 SSM-FM-11A10	24 V ac/dc	2 PNP	2 NO	1 NC	5-40, 35-340, 300-2700, 1200-10500	4 A
 SSM-FM-11A20	24 V ac/dc	2 PNP	2 NO	1 NC	10-80, 80-650, 600-5300, 2400-20000	4 A

## Interface Modules

Models	Supply Voltage	Inputs	Safety Outputs	Aux. Outputs	Output Rating	Output Response Time
 SR-IM-9A	24 V dc	2 NC	3 NO	–	6 A	20 ms
 SR-IM-11A	24 V dc	2 NC	2 NO	1 NC	6 A	20 ms
 IM-T-9A	24 V dc	2 NC	3 NO	–	6 A	20 ms
IM-T-11A	24 V dc	2 NC	2 NO	1 NC	6 A	20 ms

# Safety Controllers – Models

## Non-expandable SC26 and SC10 Safety Controllers

Model (24V dc)	Description	Housing (H x W x D in mm)	Inputs/Convertible	Independently Controlled Safe Outputs	Maximum Safety Output Rating
 SC26-2d  SC26-2de	Base Controller, non-expandable, with LCD	110 x 45 x 128	26/8	2 Dual Channel PNP	0.5A @ 24V dc
 SC26-2  SC26-2e	Base Controller, non-expandable	110 x 45 x 128	26/8	2 Dual Channel PNP	0.5A @ 24V dc
Model (24V dc)	Description	Housing (H x W x D in mm)	Inputs/Convertible	Independently Controlled Safe Outputs	Maximum Safety Output Rating
 SC10-2roe	Base Controller	115 x 45 x 100	10/4	2 Dual Channel Relays	2x 3 NO: 6A 250V ac / 24V dc

## Expandable XS26 Safety Controllers

Model (24V dc)	Description	Housing (H x W x D in mm)	Inputs/Convertible	Independently Controlled Safe Outputs	Maximum Safety Output Rating
 XS26-2d  XS26-2de	Base Controller, expandable, with LCD	110 x 45 x 128	26/8	2 Dual Channel PNP	0.5A @ 24V dc
 XS26-2  XS26-2e	Base Controller, expandable	110 x 45 x 128	26/8	2 Dual Channel PNP	0.5A @ 24V dc
 XS8si	Safety Input Module	W: 22.5 mm	8/2	/	/
 XS16si	Safety Input Module	W: 22.5 mm	16/4	/	/
 XS2so	Safety Output Module	W: 22.5 mm	/	2 Dual Channel PNP	0.75A @ 24V dc
 XS4so	Safety Output Module	W: 22.5 mm	/	4 Dual Channel PNP	0.5A @ 24V dc
 XS1ro	Safety Relay Output Module	W: 22.5 mm	/	1 Dual Channel Relay	6A; 2 NO, 1 NC Aux
 XS2ro	Safety Relay Output Module	W: 22.5 mm	/	2 Dual Channel Relays	6A; 2x 2 NO, 2x 1 NC Aux

## Expansion Modules

Model	Supply Voltage	Inputs	Safety Outputs	Output Rating	Aux. Outputs	Output Response Time	Delay
 EM-T-7A	24 V dc	1 NC (single) or 2 NC (dual)	4 NO	6 A	–	20 ms	–
 EM-F-7G	24 V ac/dc	1 NC (single)	4 NO	6 A	–	35 ms	–
 EM-FD-7G2	24 V ac/dc	1 NC (single)	4 NO w/delay	6 A	–	–	0.5 s
 EM-FD-7G3	24 V ac/dc	1 NC (single)	4 NO w/delay	6 A	–	–	1.0 s
 EM-FD-7G4	24 V ac/dc	1 NC (single)	4 NO w/delay	6 A	–	–	2.0 s

## Accessories



SC-USB2  
■ USB Cable



SC-XM2  
■ Memory Card for XS26 and SC26



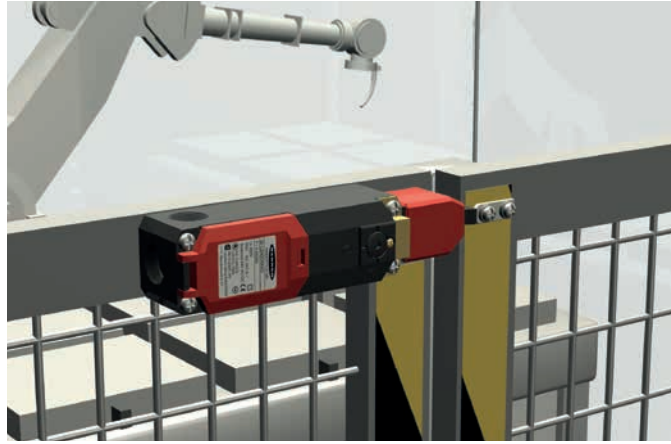
SC-XM3  
■ Memory Card for SC10



SC-XMP2  
■ SC-XM2/3 Configuration Tool



# Safety Switches



Hinge Switches



Non-Contact Switches



- One-piece sensor and actuator with hinge function
- Fast installation and set-up with repositionable safety switch point
- Stainless steel and IP69 available
- Matching hinges without sensing available for additional door support
- Available with up to 270° safety switch point operation range



- Two-piece design where sensor and actuator do not contact
- Coded magnets/tags minimize the potential for intentional defeat
- A single pair can achieve up to Category 4/PLe safety rating
- Accommodating to misalignment
- Non contact solution minimizes device wear and tear, even in applications with persistent use
- Up to IP69 solutions available

Mechanical Switches



- Two-piece design with mechanical operator feedback
- Flexible actuator options for misalignment
- Rotatable heads for flexible installation
- Mechanically coded actuator to minimize tampering
- Up to 15N latching force to reduce downtime due to vibrating doors
- One-piece limit switches available

Locking Switches



- Two-piece design with up to 2000N locking force for safety or process critical applications
- Flexible actuator options for misalignment
- Rotatable heads for flexible installation
- Mechanically coded actuator to minimize tampering
- Up to 15N latching force to position door prior to locking

Limit Switches



- Cost effective one piece sensor
- No actuator allows for fewer alignment issues
- Hideable making them more tamper-resistant
- Mechanically coded actuators use two independent operating elements to minimize intentional tampering or defeat
- Rotating head and top or side engagement allows for eight different actuator positions
- Design meets positive opening requirements for safety switches

# Non-Contact RFID Safety Switches



RFID SI-RF Switches



Single door RFID non-contact gate/door sensing solution

- Basic, medium and high tamper resistance
- Misalignment tolerance of 10 mm
- Resistant to high vibration and operations with metallic shavings
- On-board LED for status and diagnostics

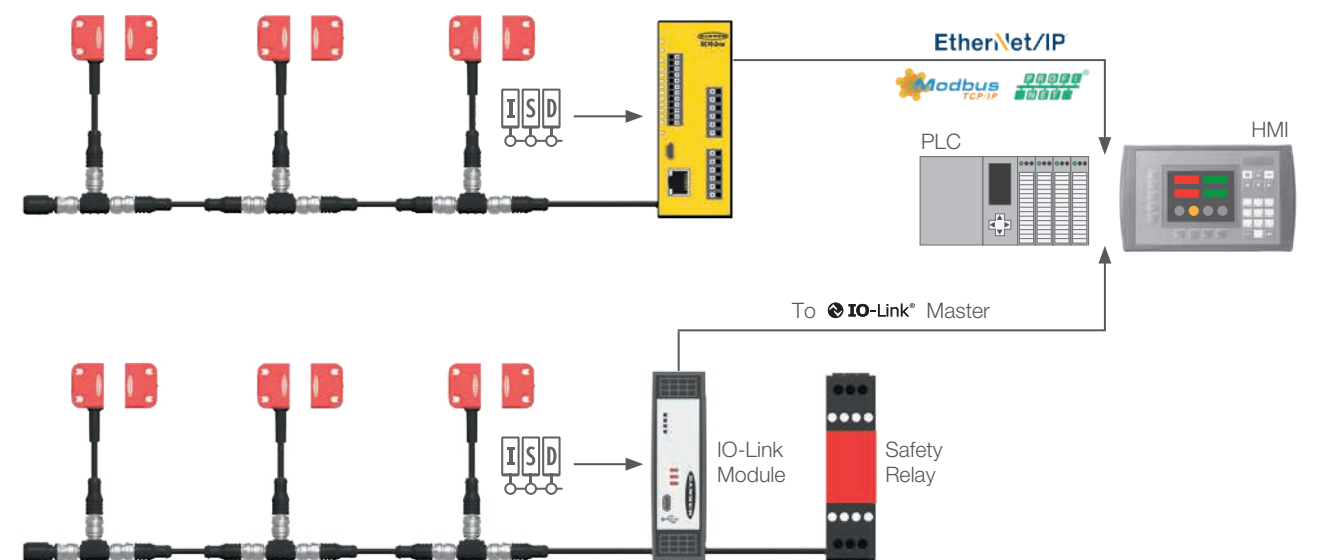
RFID SI-RF Switches – Cascade



Multiple door RFID non-contact gate/door sensing solution

- Basic, medium and high tamper resistance
- Misalignment tolerance of 10 mm
- Resistant to high vibration and operations with metallic shavings
- On-board LED for status and diagnostics
- Connect up to 32 sensors in cascade while maintaining the highest level of safety
- 4-pin QD connections for cost-effective, simple, error-free installation

RFID Cascade with In-Series Diagnostics



In-Series Diagnostics (ISD) provides users with status and performance data from each sensor in a cascade chain. The ISD data collected is converted to industrial Ethernet/IO-Link so it can be accessed with an HMI or similar device.

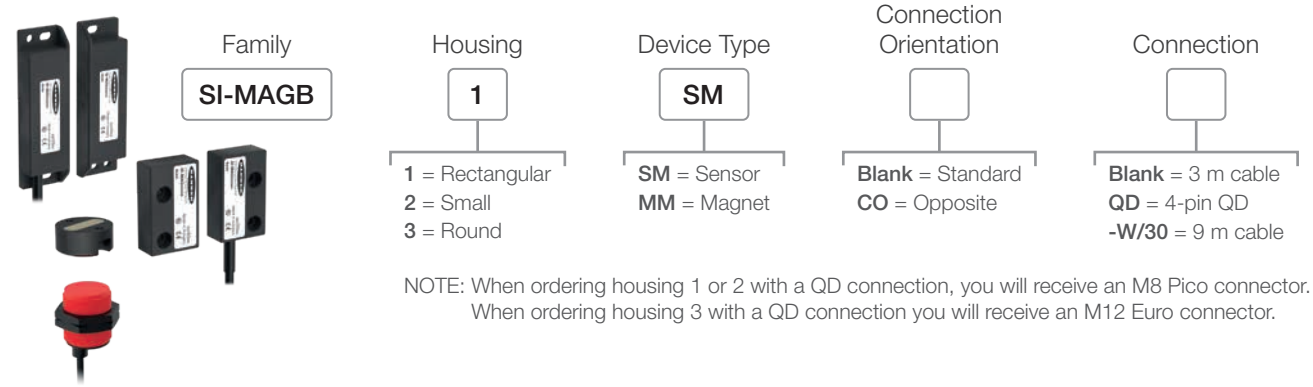
Users receive notification when an event has occurred as well as where in the series the event occurred. Events include the opening or closing of a door, door misalignment, wrong actuator, and a number of switch health attributes.



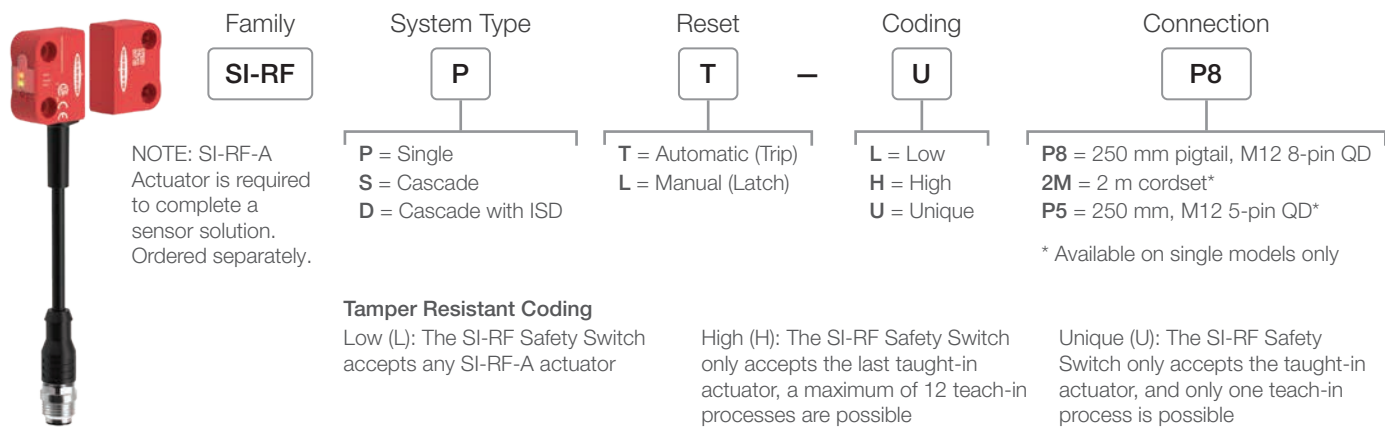


# Safety Switches – Model Keys

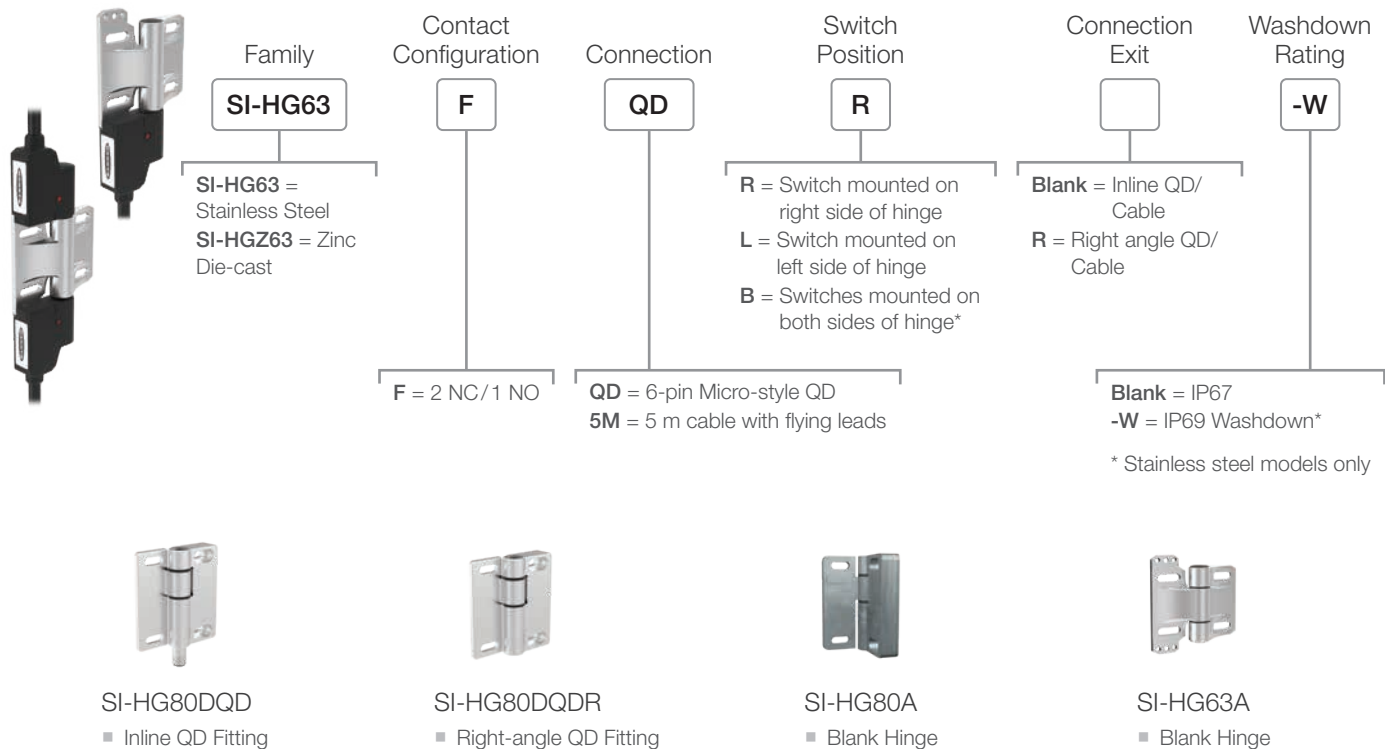
## Magnetic Switches



## RFID Switches

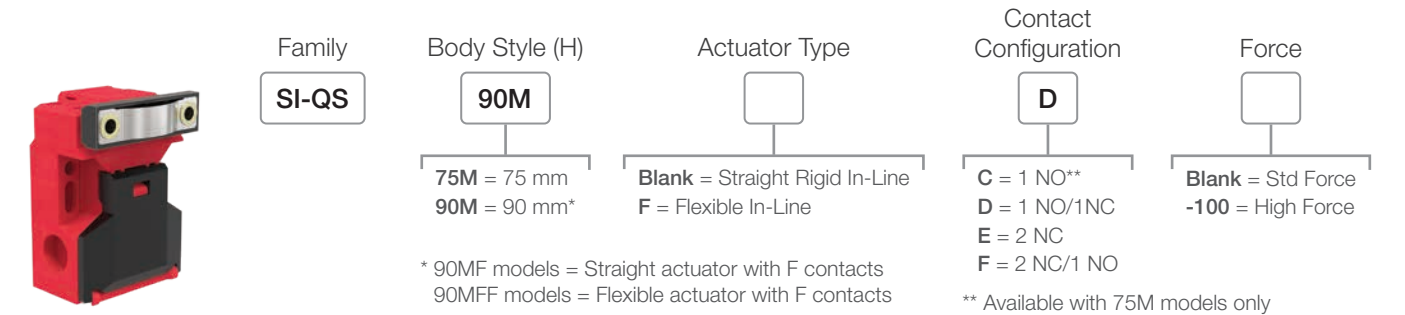
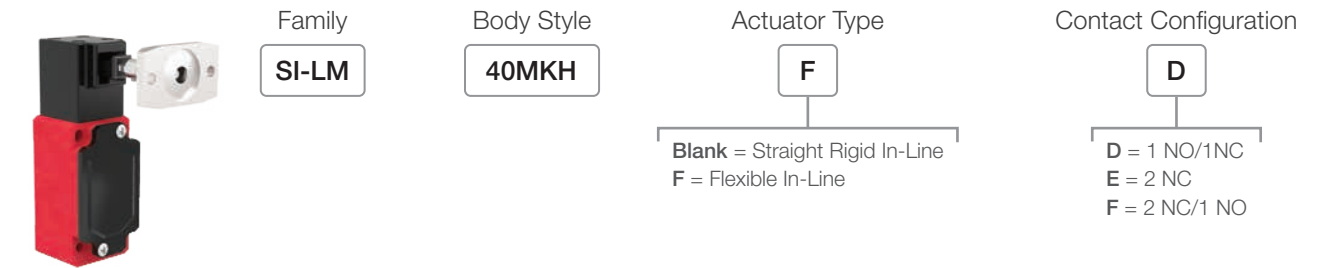
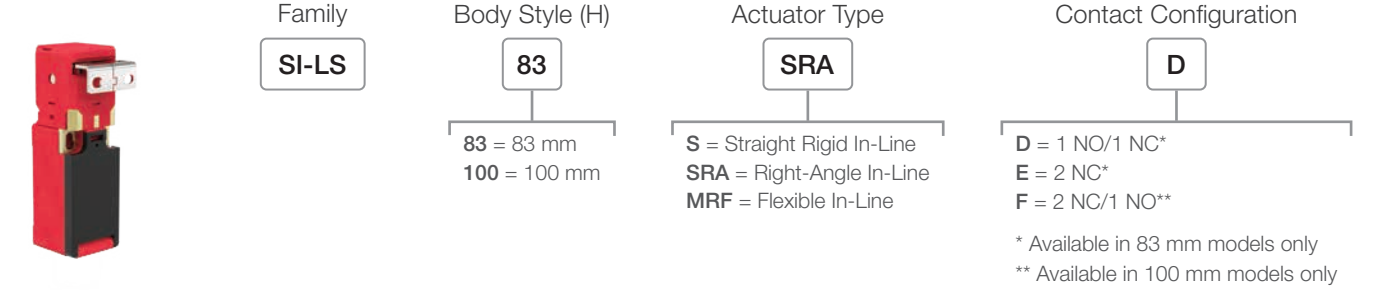


## Hinge Switches

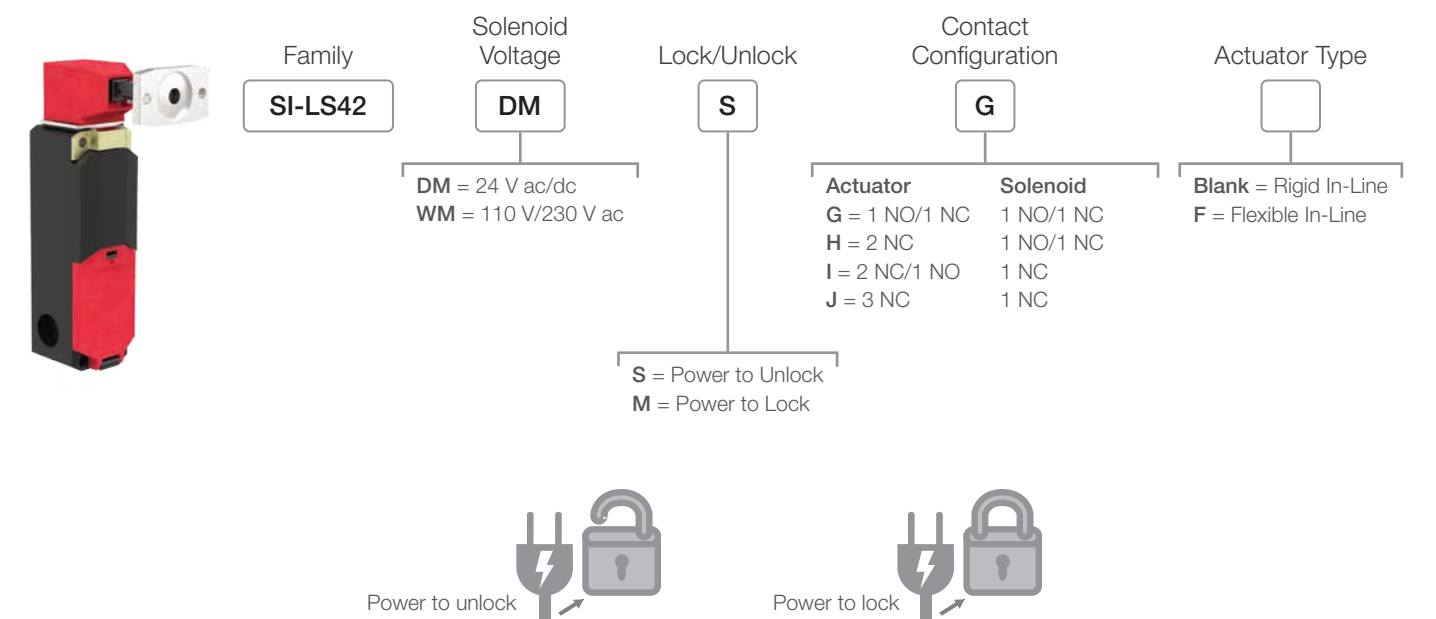


# Safety Switches – Model Keys

## Mechanical Switches




## Locking Switches




# Safety Switches – Model Keys

## Limit Switches


**Family** SI-LM  
**Body Style** 40  
**Actuator Type** PB  
**Contact Configuration** D


PB = Plunger  
 RC18 = Roller  
 LA18 = Spindle-mount lever (18 mm roller)  
 L20 = Lever (20 mm roller)

D = 1 NO/1 NC  
 E = 2 NC  
 F = 2 NC/1 NO


**Family** SI-LS  
**Body Style** 31  
**Actuator Type** PB  
**Contact Configuration** D

PB = Plunger  
 RC10 = Roller  
 LA18 = Spindle-mount lever (18 mm roller)  
 LE11 = Lever (11 mm roller)  
 L22 = Lever (22 mm roller)


D = 1 NO/1 NC  
 E = 2 NC  
 F = 2 NC/1 NO


**Family** SI-LS  
**Body Style** 83  
**Actuator Type** PB  
**Contact Configuration** D

PB = Plunger  
 RC10 = Roller  
 LA18 = Spindle-mount lever (18 mm roller)  
 LE13 = Lever (13 mm roller)


D = 1 NO/1 NC  
 E = 2 NC

## Hinge Switches


**Family** SI-LS  
**Body Style** 31  
**Actuator Type** HG  
**Contact Configuration** D

HG = Vertical hinged lever  $\pm 90^\circ$   
 HGR = Right-hand hinged lever  $180^\circ$   
 HGL = Left-hand hinged lever  $180^\circ$

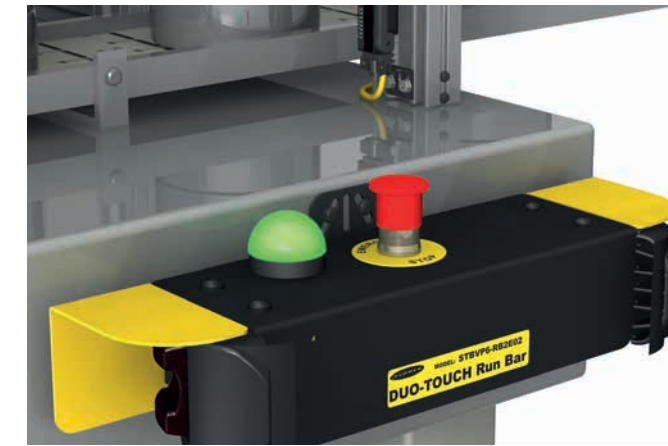
D = 1 NO/1 NC  
 E = 2 NC


**Family** SI-LS  
**Body Style** 31  
**Actuator Type** RT  
**Contact Configuration** D

RT = Rotary shaft

D = 1 NO/1 NC  
 E = 2 NC

# Enabling Devices



A two-hand control safeguarding system will prevent the operator from approaching the machine while a hazard is present. Duo-Touch Run Bar provides an all-in-one solution.

Handheld grip-styled switches are used for manual control of machine functions, including visual observations, minor adjustments, calibration and more.

## Two-Hand Control

STB Self-Checking Touch Buttons				
Model	Connection	Touch Surface Material	Output	Power Supply
STBVP6	2 m cable	Polyetherimide (PEI)	Solid-state 2 Complementary PNP (1 ON, 1 OFF)	10-30V dc
STBVP6Q5	4-pin M12 QD			
STBVR81	2 m cable	Polyetherimide (PEI)	E/M Relay 2 Complementary SPST (1 NC, 1 NO)	20-30V ac/dc
STBVR81Q6	5-pin M12 QD			

STB buttons include yellow field cover to prevent unintended switching. To comply to safety standards, STB buttons must be used with appropriate Two-Hand control modules, SC26, XS26 or SC10 Safety Controller or comparable Type IIIC Two-Hand system.

DUO-TOUCH Two-Hand Control Kits with STB Touch Buttons					
2 NO Safety Outputs, no auxiliary outputs, 24V ac/dc power supply, meets Cat 4 and Type IIIC					
Kit	Module	IP Rating	STB Buttons (2 pieces)	IP Rating	Connection
ATK-VP6	AT-FM-10K	IP20	STBVP6	IP66	2 m cable
ATK-VP6Q5	AT-FM-10K	IP20	STBVP6Q5	IP66	4-pin M12 QD

Kit does not include run bar

## Two Hand Control Run Bars

Run Bars with STBVP6		
Model	Connection	E-Stop
STBVP6-RB2	Terminal strip	Not included
STBVP6-RB2Q8	8-pin 7/8 QD	Not included
STBVP6-RB2E02	Terminal strip	SSA-EBM-02L

## Enabling Devices

ED1G Enabling Devices		
Model	Contact Configuration	Momentary Push Button
ED1G-L21SM-1N	2 NO & 1 NC Aux	/
ED1G-L21SMB-1N	2 NO & 1 NC Aux	1 NO
ED1G-L20MB-1N	2 NO	2 NO



# E-Stop Devices Selection

Choose an E-Stop; Safely Start and Stop Machines.

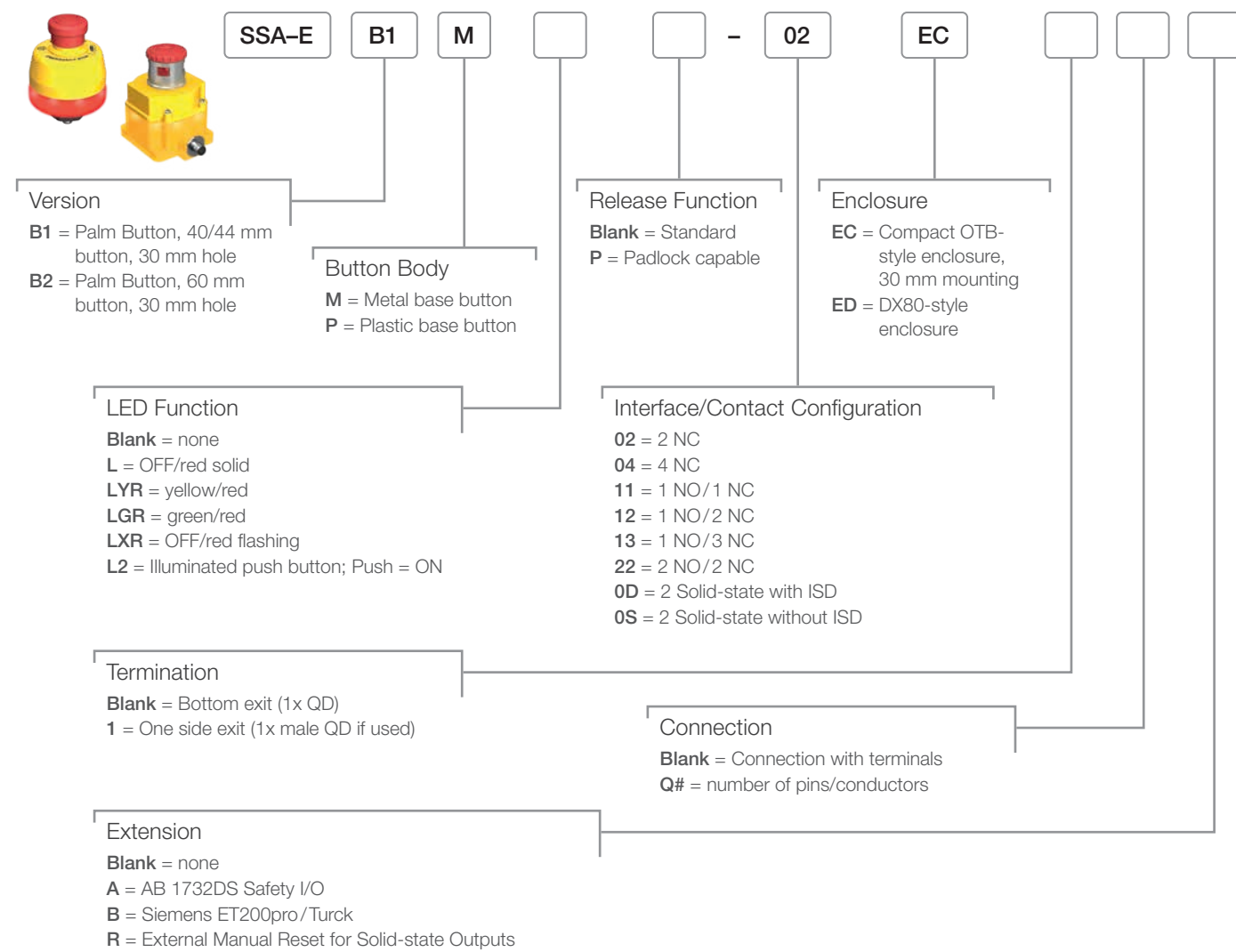
- Emergency Stop Buttons
- Illuminated Emergency Stop Button
- Rope Pulls and Domed Indicators



		SSA-EBM		SSA-EB		Emergency Stop Switches			Rope Pull Emergency Stop Switches				
		SSA-EBM1PL	SSA-EB1P	SSA-EB1M	RP-RM83	RP-LS42	RP-QM(T)72	RP-LM40	RP-QM90				
E-Stop		✓	✓		✓	✓	✓	✓	✓	(specific models)			
Rope Pull					✓	✓	✓	✓	✓	(only stop control)	(only stop control)	✓	
Button Size (mm)		40 mm	40 / 44 / 60 mm		40 / 60 mm	40 / 60 mm	44 mm	32 mm	32 mm				
Illuminated Housing					✓			✓					
Illuminated Button			✓		(specific models)	(specific models)							
Release		✓	✓		✓	✓	✓	✓					
Lock/Unlock Button								✓					
Rope Length (m)									38 m 70 m	25 m 37.2 m 75 m	6 m 12 m 20 m	6 m	50 + 50 m
Rope Connection									Built-in turnbuckle / Ring connection	Built-in turnbuckle / Ring connection	Ring connection	Ring connection	Ring connection
ISD (In-Series Diagnostics)					✓	✓							
Safety Contacts		1 NC 2 NC	1 NC 2 NC 3 NC 4 NC		1 NC 2 NC 4 NC	1 NC 2 NC 4 NC	1 NC 2 NC 4 NC	2 NC	2 NC	2 NC 4 NC	2 NC	2 NC	
Auxiliary Contacts		1 NO	1 NO 2 NO		1 NO 2 NO	1 NO 2 NO	1 NO 2 NO	2 NO	2 NO	1 NO (specific models)			2 NO
OSSD Outputs					✓	✓							
Connection		Screw terminals	Screw terminals		M12 / Screw terminals	M12 / Screw terminals	M12 / Screw terminals	Screw terminals	Screw terminals	Screw terminals	Screw terminals	Screw terminals	Screw terminals
Panel/Bracket Hole (mm)		22 mm	30 mm		30 mm	30 mm							

# E-Stop Devices – Model Keys

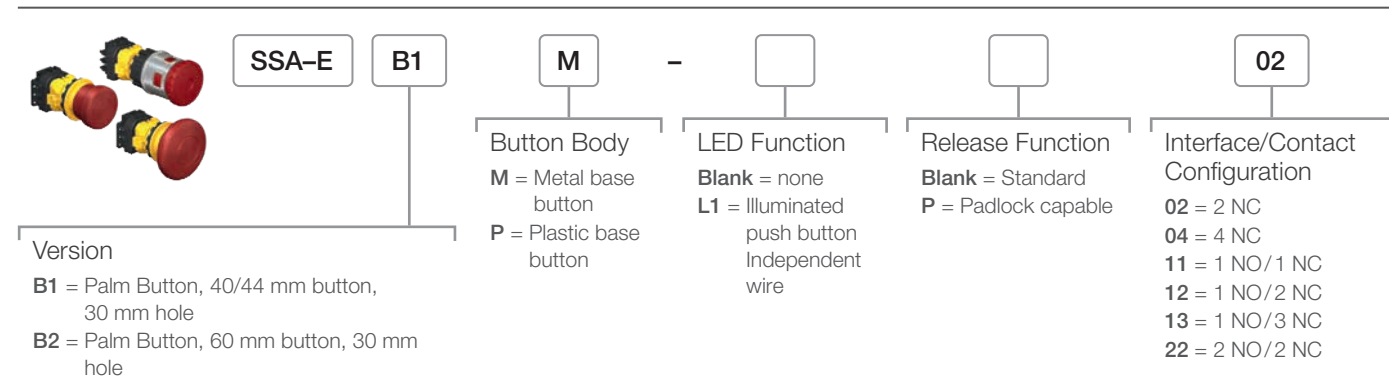
## E-Stop Buttons



## Accessories

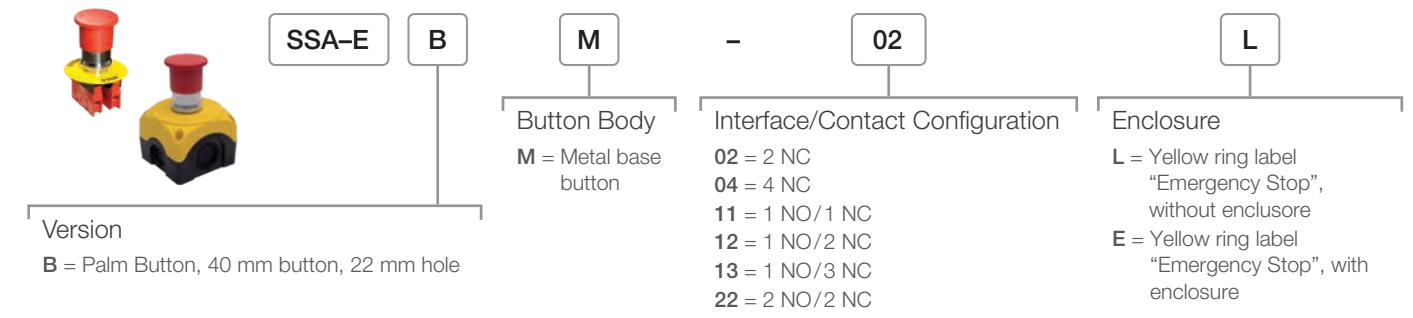


## Panel Mount E-Stop Buttons



# E-Stop Devices – Model Keys

## E-Stop Buttons Kits



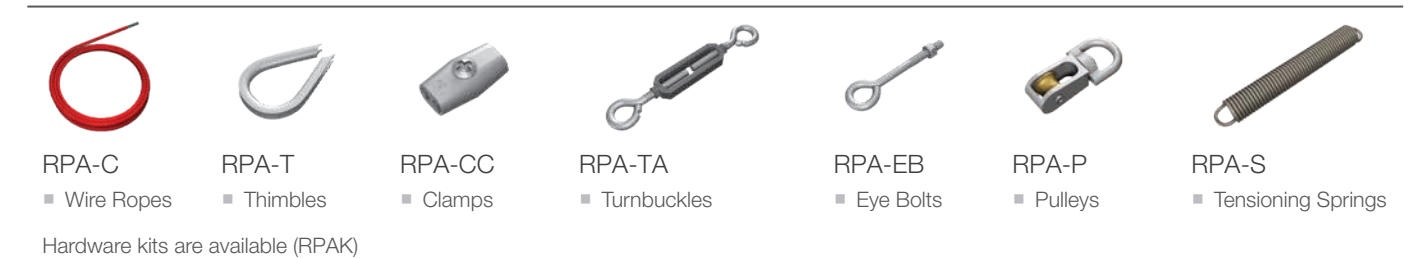
## Rope Pull E-Stop Devices

Model	Maximum Rope Length	Safety Contacts	Auxiliary Contacts	Actuation	Housing Material
<b>RP-RM83F-..L..</b>	38 m – 75 m	2 NC in	2 NO in	Latch	Metal, IP67
Models with <b>T</b> suffix have a built-in turnbuckle for rope Models with <b>R</b> suffix have a ring connection to rope Models with <b>E</b> suffix have an auxiliary status output					
<b>RP-LS42F-..LE</b>	25 m – 37.5 m – 75 m	2 NC in	2 NO in	Latch	Plastic
Models with <b>LE</b> suffix have a built-in turnbuckle for rope					

## Rope Pull Switches

Model	Maximum Rope Length	Safety Contacts	Auxiliary Contacts	Actuation	Housing Material
<b>RP-LS42F-..L</b> <b>RP-LS42F-..LF</b>	25 m – 37.5 m – 75 m	2 NC in	2 NO in	Latch	Plastic
Models with <b>LF</b> suffix have a built-in turnbuckle for rope Models with <b>L</b> suffix have a ring connection to rope					
<b>RP-QM72D-6L</b> <b>RP-QM72D-12L</b> <b>RP-QM72D-20L</b>	6 m 12 m 20 m	2 NC in	/	Latch	Metal
<b>RP-QMT72F-12L</b> <b>RP-QMT72E-12L</b>	12 m	4 NC in 2 NC in	/ 1 NO in	Latch	Metal
<b>RP-LM40D-6</b> <b>RP-LM40D-6L</b>	6 m	2 NC in	/	Trip Latch	Metal
<b>RP-QM90F-100L</b>	100 m (50 m each side)	2 NC in	2 NO in	Latch	Metal

## Components for Wire Rope Assembly







more sensors, more solutions



Lighting & Indication



LED Task Lights



Tower Lights



Indicators



Touch Buttons and Pick-to-Light

# Light Up the Visual Factory

Enhance your Visual Management Efforts with Banner's Lighting and Indicators.



## Illuminate the Work Area with LED Lighting

page 13

- Boost Worker Productivity
- Improve Product Quality
- Increase Worker Safety

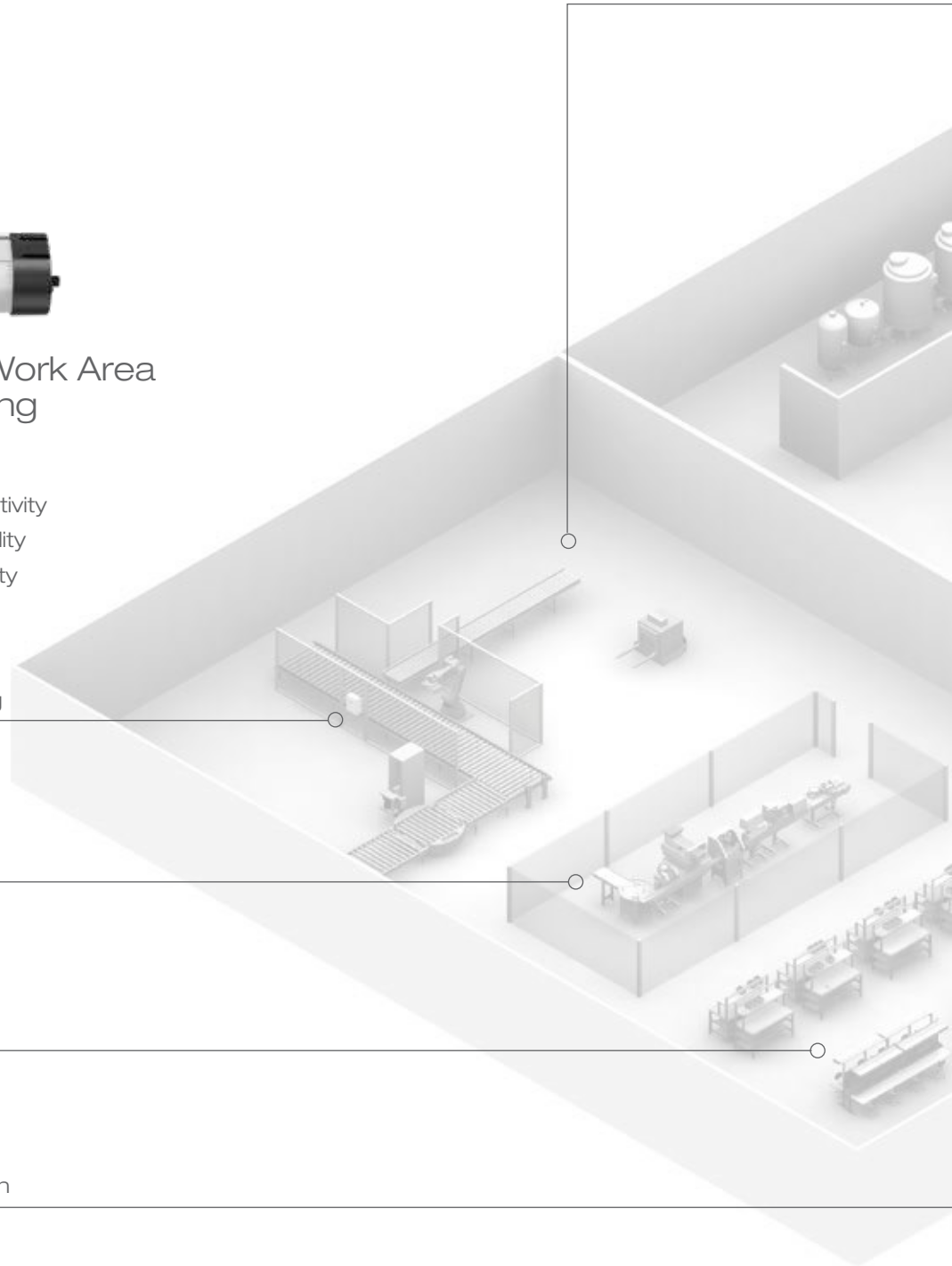
Electrical Panel Lighting

Machine Lighting

Workstation Lighting

Visual Inspection Station

Sensor Emulation



## Communicate Status

pages 45, 63

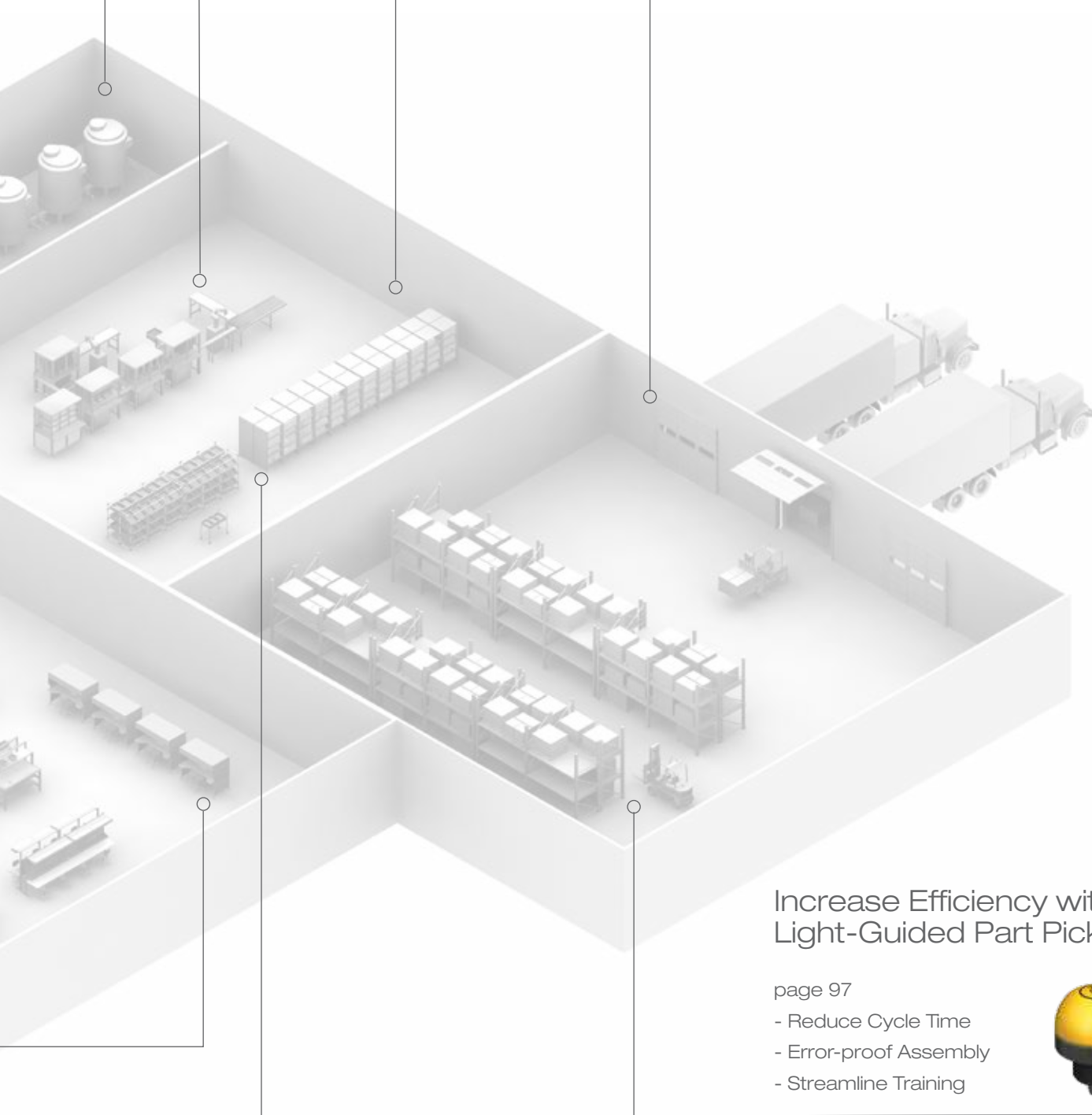
- Empower Operators
- Alert Supervisors
- Accelerate Resolution



Machine and  
Process Status

Call for  
Parts

Loading Dock/Bay  
Communication



## Increase Efficiency with Light-Guided Part Picking

page 97

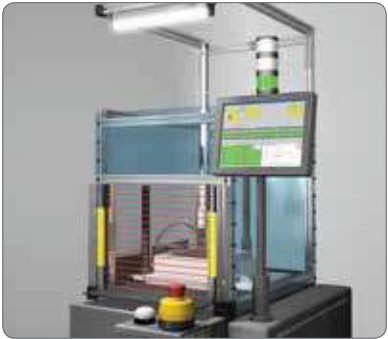
- Reduce Cycle Time
- Error-proof Assembly
- Streamline Training



Pick-to-Light for  
Assembly and Kitting

Pick-to-Light for  
Warehouse and Logistics

# Lights to See



Increase productivity, improve product quality and reduce costs with Banner's industrial LED lighting products. Banner has a suitable model for the harshest environments – even chemical, extreme temperature and washdown areas.

**Boost Productivity** – Proper light levels increase the speed and accuracy of visual task performance, reducing assembly times and increasing output.

**Enhance Inspection** – White, colored and multicolored options in different form factors allow for control of color, intensity and angle, improving detection of part defects during assembly and inspection.

**Reduce Costs** – Reduce costs by eliminating wastes such as defects, waiting, overproduction, transportation and others in the production environment.



# Lights to Follow



Highly visible indicators with real-time feedback provide guidance and status information for assembly and kitting applications.

**Accelerate Processes** – Colored indicators guide operators quickly to the correct part location and accelerate training procedures.

**Improve Quality** – Integrated feedback drives increased operator accuracy and provides quality control metrics.

**Save Time** – Save Time - easily retrofit existing equipment with new solutions.

# Give Equipment a Voice



Machine status indicators with clear on and off states provide improved communication across the manufacturing floor. Wireless options simplify installation, facilitate remote monitoring and data collection, and allow for rapid status communication in and out of the plant.

**Reduce Downtime** – Immediate attention to problems as they occur reduces downtime, improves quality and reduces safety issues.

**Speed Recognition** – Status is conveyed through color, position, text, symbols or audible alarm. No time is lost deciphering the information.

**Speak Globally** – Products are certified for use around the world and conform with international standards. Rely on Banner's vast network to support you fully.



Operators and supervisors with clear information when and where they need it react quickly and correctly, resulting in efficient problem resolution. Long term gains in overall equipment effectiveness follow from continued monitoring and data analysis.

**Empower Operators** – Illuminated indicators, touch buttons and E-stops show status clearly, giving workers the ability to act quickly and confidently when problems occur.

**Alert Supervisors** – Tower lights, indicators and advanced lights communicate machine, work cell and inventory status, helping supervisors identify and resolve issues effectively

**Maximize Uptime** - Wireless and standard devices can track machine and operator performance, allowing for effective scheduling of maintenance and changeovers.



# Trends

## Illumination + Indication

Unlock new user benefits throughout the manufacturing floor and help staff meet important management objectives



## Supply Chain Simplification

Standardizing on a single, flexible model simplifies ordering and spare parts without sacrificing functionality.



Cascadeable lights



Multiple colors in one unit with flexible I/O configuration



Magnetic mounting options for easy installation and portability

## Customization

Work with Banner on a variety of modifications to get exactly the solution you need.



Light sections can be permanently laser marked with custom text or images

Variety of audible options, including programmable



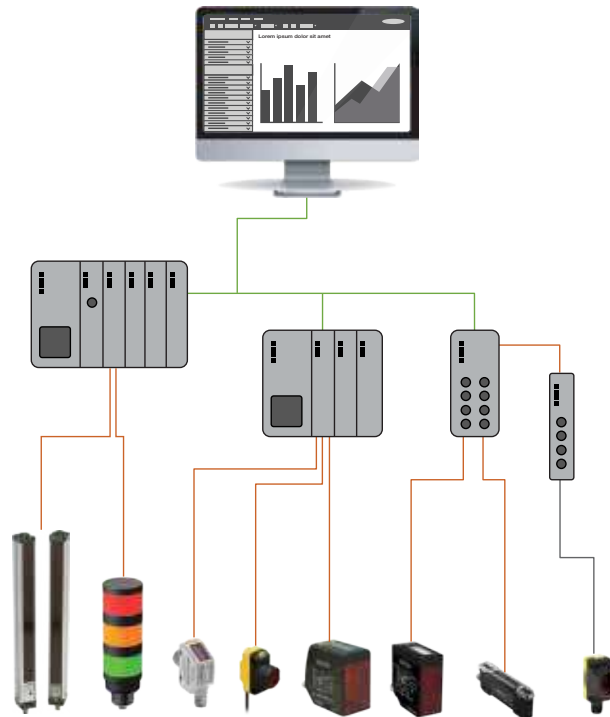
Wireless options to avoid costly wiring runs



Color and animation options available



# IO-Link



## What is IO-Link?

IO-Link (IEC61131-9) is an open standard serial communication protocol that allows for the bi-directional exchange of data from sensors and devices that support IO-Link and are connected to a master. The IO-Link master can transmit this data over various networks, fieldbuses, or backplane buses, making the data accessible for immediate action or long-term analysis via an industrial information system (PLC, HMI, etc.). Each IO-Link sensor has an IODD (IO Device Description) file that describes the device and its IO-Link capabilities.

## 5 Advantages of IO-Link

### 1. Standardized and Reduced Wiring

IO-Link devices do not require any special or complicated wiring, but can be connected using the same cost-effective standard unshielded 3-wire cables as conventional discrete I/O. In addition, IO-Link also eliminates the need for analog sensors and reduces the variety of cord sets required for sensors, which saves inventory costs. IO-Link also supports a master-slave configuration with passive connection points, which further reduces wiring requirements.

### 2. Increased Data Availability

Access to sensor-level data helps ensure the smooth operation of system components, streamlines device replacement, and enables optimized machine maintenance schedules—all of which save costs and reduce the risk of machine downtime.

This wealth of valuable data made available through IO-Link is integral for the Industrial Internet of Things (IIoT) and Industry 4.0 initiatives.

### 3. Remote Configuration and Monitoring

With IO-Link, users can read and change device parameters through the control system software, enabling fast configuration and commissioning that saves time and resources. In addition, IO-Link allows operators to dynamically change the sensor parameters from the control system as needed—such as in the case of product changeover—which reduces downtime and allows machines to accommodate greater product diversity.

In addition, the ability to monitor sensor outputs, receive real-time status alerts, and adjust settings from virtually anywhere allows users to identify and resolve problems that arise on the sensor level in a timely manner. This capability reduces costly downtime and improves overall efficiencies.

### 4. Simple Device Replacement

In addition to the ability to remotely adjust sensor settings, IO-Link's data storage capability also allows for automated parameter reassignment in case of device replacement (also known as Auto-Device Replacement or ADR). Users can import existing sensor parameter values into a replacement sensor for seamless replacement, getting the new device up and running as quickly as possible.

### 5. Extended Diagnostics

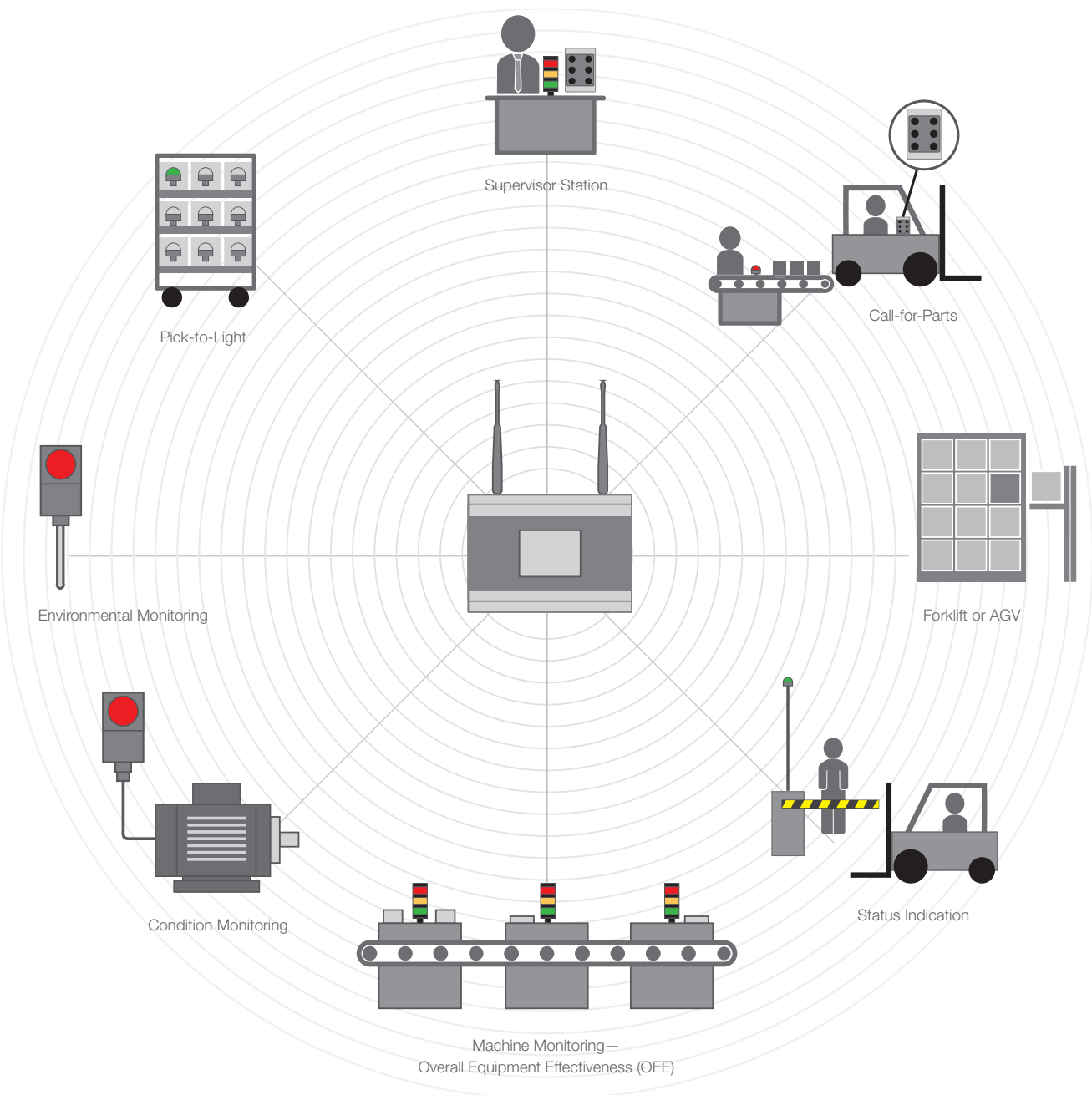
IO-Link provides users with visibility into errors and health status from each device. This means that users can see not only what the sensor is doing but also how well it is performing—a valuable insight into a machine's efficiency. In addition, extended diagnostics allow users to easily identify when a sensor is malfunctioning and diagnose the problem without shutting down the line or machine.

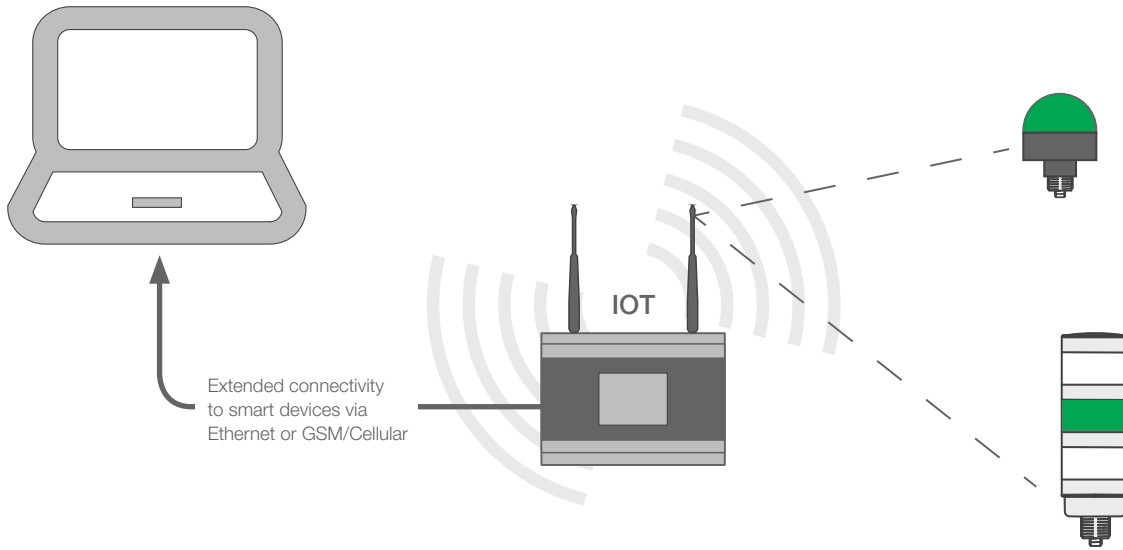
The combination of real-time and historic data not only reduces troubleshooting efforts as issues arise but also allows for optimization of machine maintenance schedules, saving costs and increasing efficiency in the long term.



# Wireless Monitoring and Status Indication

Wireless monitoring and indication products from Banner Engineering can increase productivity, reduce downtime, and provide data to optimize your operation. Banner's wireless products eliminate expensive cable runs, are easy to install and set up, and can integrate machines that were not previously network capable.





### Wireless TL70 Tower Light

A bright 70 mm tower light with wireless networking provides local and remote status information and has inputs for process monitoring.  
page 48



### Wireless Q120 6-Button Pendant

The wireless Q120 6-button pendant is an autonomous node with six independent push button inputs and six sets of LED indicators.



### Wireless K70 Touch Button

The K70 touch button is an ergonomic solid state switch with integrated multicolor indication functions. Bidirectional wireless communication provides a simple operator interface for pick-to-light, call button, and general industrial applications.  
page 108



### Wireless Q45U Node

The Q45 universal node works with all Sure Cross® sensors with a 1-wire serial interface.



### Wireless K70 Indicator

Bright, multicolor K70 indicators offer status indication and remote monitoring in a compact package for greater versatility in deployment.  
page 72



### Control Your Wireless Networks with the DXM100 Controller

The DXM100 is an industrial wireless controller developed to facilitate Ethernet connectivity and Industrial Internet of Things (IIoT) applications.



### Node

The Node collects data and wirelessly transmits this data to the Gateway.



### Gateway

The Gateway accepts data and interfaces to the control system and plant networks or can be wired directly to discrete I/O devices.





# LED Lighting

Banner Engineering's industrial LED lighting products are high-quality and energy-efficient lights that provide bright illumination for up to 50,000 hours. Robust, vibration-resistant housings and sleek designs make Banner Engineering's LED lighting ideal for a wide range of industrial applications, including machine lighting, enclosure lighting, visual inspection illumination and work cell lighting.

# Selection Guide



Page	16	26	20	22	24
Family Name	WLS28-2	WLS27	WLS15	WLB32	WLB92
Length (mm)	145 to 1130	145 to 1130	220 to 1200	285 to 1130	550 and 1100
AC/DC	DC	DC	DC	AC and DC	AC and DC
Lumens per Foot (300 mm)	650	650	350	650	1750
Dual/Multi Color Options					
Color Options					
IP Rating	IP50 (unsealed) IP67, IP69K (sealed)	IP66, IP67, IP69K	IP66, IP67	IP50	IP40
Cascadeable					





30

30

32

34

36

38

WLC60

WLH60  
High Temp

WLC90

WLA

WL50S

WL50-2

340 and 640

340 and 640

89 x 91

105 x 180 to  
360 x 180

ø 50

ø 50

DC

DC

DC

DC

DC

DC

1300

1000

700

550

295

185



IP68, IP68g, IP69K

IP68, IP69K

IP68, IP68g, IP69K

IP67, IP69K

IP67, IP69K

IP67, IP69K



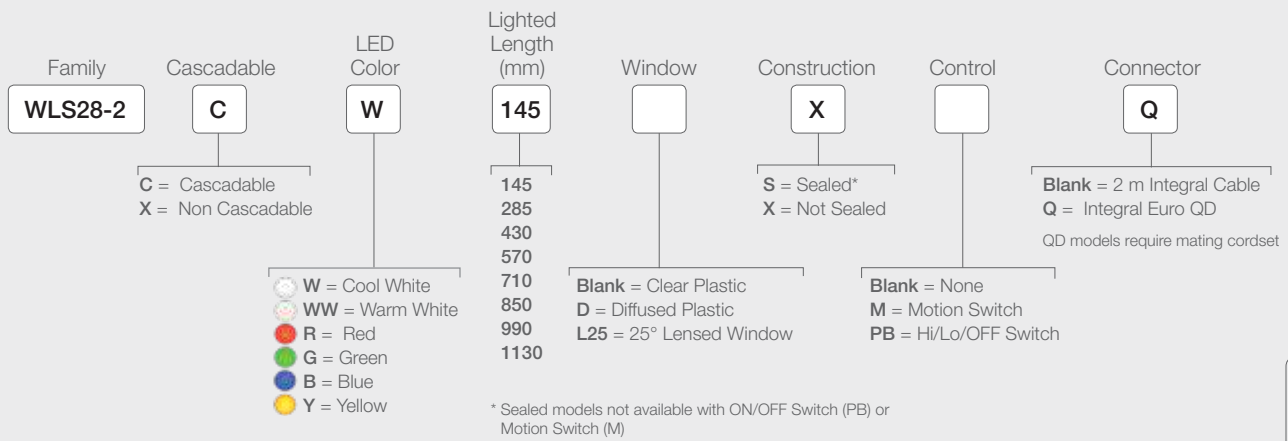


## WLS28-2 LED Strip Lights

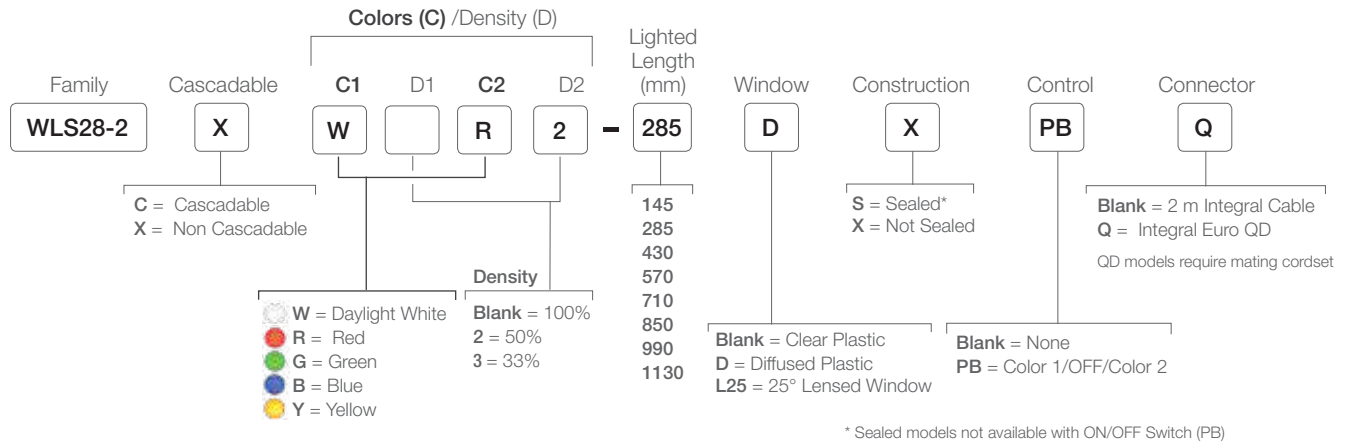
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- Compact, space-saving design
- Rugged, water-resistant IP69K option
- Available in 8 lengths from 145 to 1130 mm
- Lensed models or choice of clear or diffuse window
- Cascade models for connecting multiple lights end-to-end, minimizing wiring
- UV 365 nm and 395 nm wavelength models available for UV fluorescent and non-fluorescent applications
- High/Lo/Off switch and non-switch models available
- Low power consumption less than 9 watts per foot
- Optional snap clips for easy installation and repositioning
- Automatic temperature protection built into the unit. Above 50 °C, the light dims to manage heat and protect product lifetime

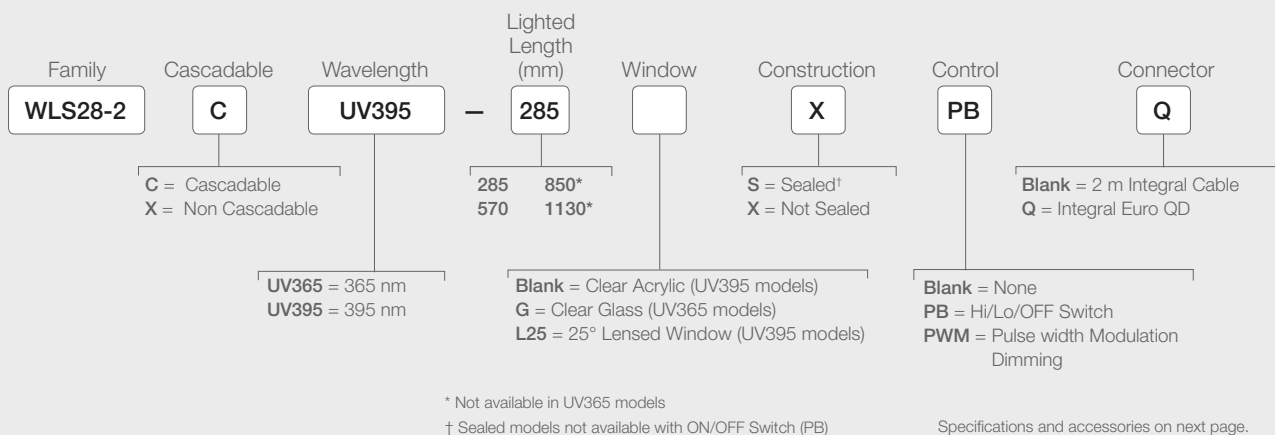
## Single-Color



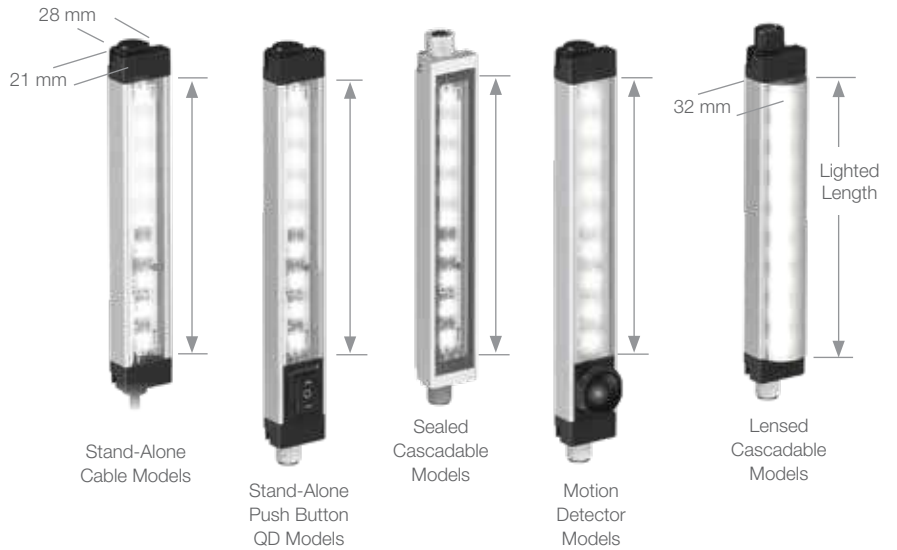
## Dual-Color



## UV Models



<b>Supply Voltage</b>	12 to 30 V dc
<b>Construction</b>	Housing: Clear anodized aluminum End Caps: Painted zinc Window: Polycarbonate.
<b>Environmental Rating</b>	Non-sealed Models: IEC IP50 Sealed Models: IEC IP67/IP69K per DIN 40050
<b>Operating Temperature</b>	-40 to +70 °C (-40 to +158 °F)
<b>Certifications</b>	



### Single-Color

Length (mm)	Lumens* (Typical @ 25 °C)					Typical Wattage** (Watts)
	Cool & Warm White	Red	Green	Blue	Yellow	
145	400	55	180	40	50	3.6
285	800	110	360	80	100	7.2
430	1200	165	540	120	150	11.0
570	1600	220	720	160	200	14.6
710	2000	275	900	200	250	18.5
850	2400	330	1080	240	300	22.1
990	2800	385	1260	280	350	25.9
1130	3200	440	1440	320	400	29.8

\*Lumen values lowered by 25% on diffused window models  
\*\*Typical operating wattage is measured at 24 V dc

### Dual-Color

Length (mm)	Lumens* (Typical @ 25 °C)					Typical Wattage** (Watts)
	Daylight White	Red	Green	Blue	Yellow	
145	237	100	150	55	75	3.6
285	475	200	300	110	150	7.2
430	713	300	450	165	225	10.8
570	950	400	600	220	300	14.6
710	1188	500	750	275	375	18.2
850	1425	600	900	330	450	22.1
990	1663	700	1050	385	525	25.7
1130	1900	800	1200	440	600	29.8

\*Lumen values lowered by 25% on diffused window models  
\*\*Typical operating wattage is measured at 24 V dc

#### Top Mount



SMBWLS28RA  
(included with light)

#### Side Mount



SMBWLS28SM

#### Magnetic Mount Shown with SMBWLS28RA



SMBWLSMAG  
SMBWLSMAGR  
Protective cover for magnet  
sold separately

#### Snap Mount



SMBWLS28SP



**4-Pin M12/  
Euro-Style**  
Straight connector models  
listed; for right-angle, add RA  
to the end of the model number  
(example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')

**4-Pin M12/Euro-Style**  
Double-Ended  
(straight male/straight  
female connectors)

**MQDEC-401SS**  
0.3 m (1')  
**MQDEC-403SS**  
1 m (3')  
**MQDEC-406SS**  
2 m (6.5')

**4-Pin M12/Euro-Style**  
Splitter

**CSB-M1241M1241**  
0.3 m (1') male trunk;  
2 x 0.3 m (1') female  
branches



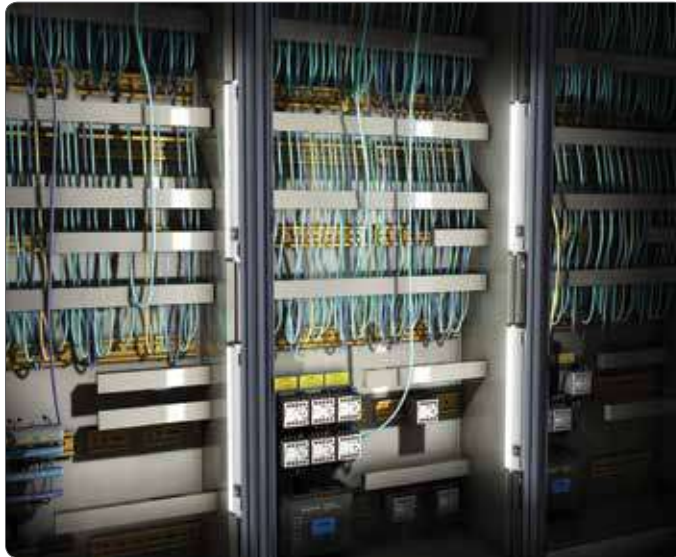
**PSD-24-4**  
Class 2 Power Supply  
Input: 90-264 V ac 1.5A  
Output: 24 V dc 3.9A  
2 m (6.5') 4-Pin Euro Connector



**WLS28-2PBQ**  
In-Line Switch with  
M12 Connectors



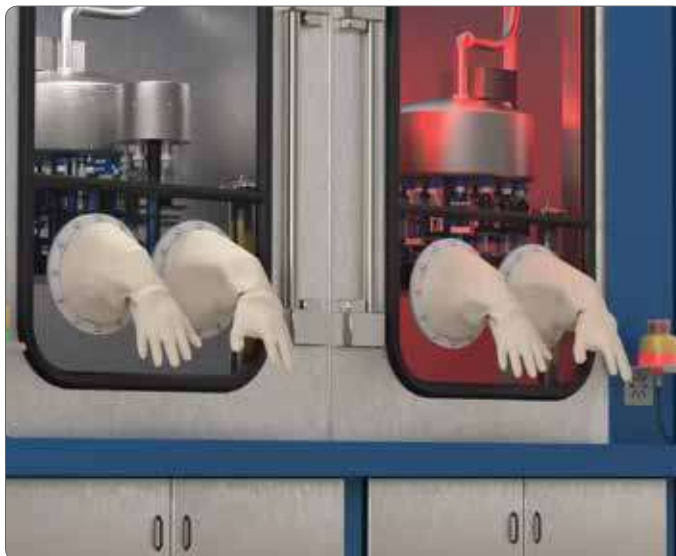
**WLS28-2MQ**  
In-Line Motion  
Detection Switch with  
M12 Connectors



WLB32



WLC60



WLS27

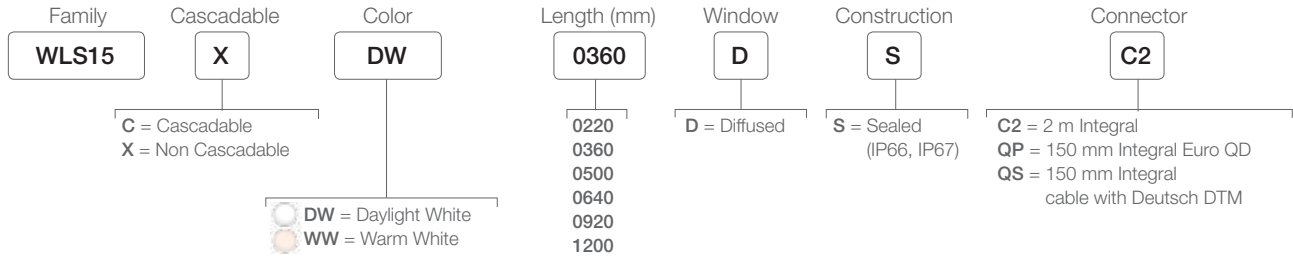




## WLS15 LED Strip Lights

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- Low-profile design for easy installation in tight spaces
- 12 or 24 V dc operation in one model
- Completely sealed with an IP67 rating for use in wet or dusty environments
- The rugged construction and polycarbonate shell resists shock and vibration while remaining lightweight
- LED lighting technology saves energy and minimizes replacement costs
- Brackets and connectors are available to keep installation simple
- Draws half the current of other lights for a low power device and high energy savings
- Offers stability in the presence of line voltage fluctuations




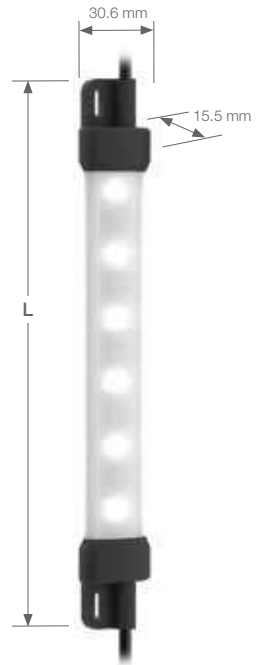
**Supply Voltage and Current** | 12 V dc or 24 V dc nominal

**Construction** | Clear anodized aluminum inner housing; Polycarbonate outer housing, Polyamide end caps

**Environmental Rating** | Rated IEC IP66 and IEC IP67  
Suitable for wet locations per UL 2108

**Operating Conditions** | **Temperature:** -40 to +60 °C  
**Storage Temperature:** -40 to +70 °C

**Certifications** | 



Length (mm)	Typical Current (A) at 25 °C		Maximum Current (A) at -40 °C		Lumens	
	12 V dc	24 V dc	12 V dc	24 V dc	Daylight White	Warm White
0220	0.19	0.10	0.24	0.12	175	170
0360	0.38	0.20	0.48	0.24	350	340
0500	0.57	0.30	0.72	0.36	525	510
0640	0.76	0.40	0.96	0.48	700	680
0920	1.14	0.60	1.44	0.72	1050	1020
1200	1.52	0.80	1.92	0.96	1400	1360



LMBWLS15

LMBWLS15-150S

**4-Pin M12/Euro-Style Straight**  
 Straight connector models listed; for right-angle, add RA to the end of the model number (example, MQDC-406RA)

**4-Pin M12/Euro-Style Double-Ended**  
 (straight male/straight female connectors)

**4-Pin M12/Euro-Style Splitter**

**MQDC-406**  
 2 m (6.5')  
**MQDC-415**  
 5 m (15')  
**MQDC-430**  
 9 m (30')

**MQDEC-401SS**  
 0.3 m (1')  
**MQDEC-403SS**  
 1 m (3')  
**MQDEC-406SS**  
 2 m (6.5')

**CSB-M1241M1241**  
 0.3 m (1') male trunk;  
 2 x 0.3 m (1') female branches

**4-Pin M12/Euro-Style Splitter**

**Deutsch**  
 Single-ended cordset with straight connectors

**Deutsch**  
 Double-ended cordset with straight connectors

**CSB-M1241M1241**  
 0.3 m (1') male trunk;  
 2 x 0.3 m (1') female branches

**DTMC-206**  
 2 m (6.5')  
**DTMC-215**  
 5 m (15')  
**DTMC-230**  
 9 m (30')

**DTMEC-2005**  
 0.16 m (0.5')  
**DTMEC-206**  
 2 m (6')  
**DTMEC-230**  
 9 m (30')



LMBWLS15MAG



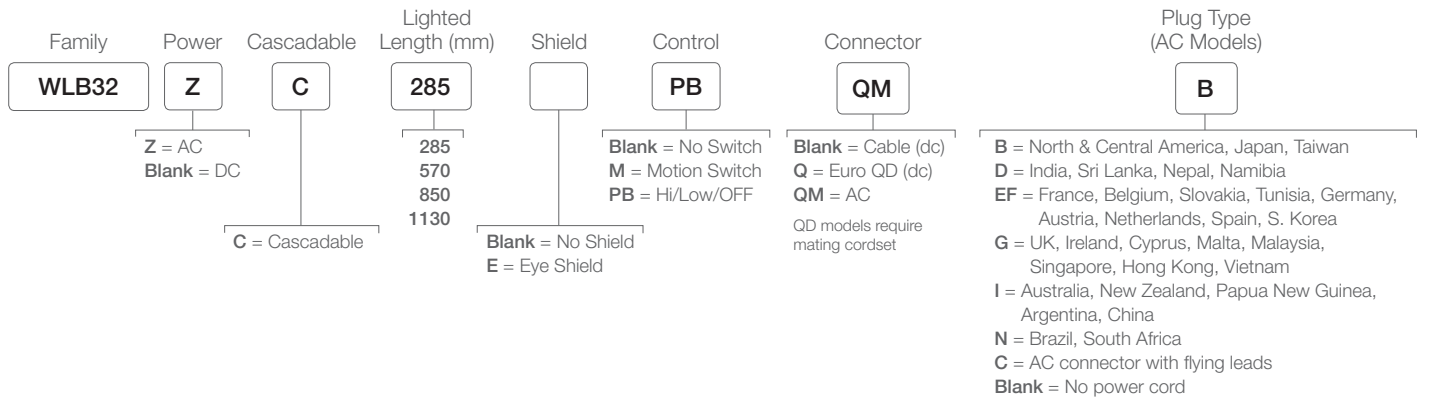
PSW-24-1  
 Power Supply



## WLB32 LED Light Bar

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- Energy efficient for overall cost savings
- High/Low/Off switch allows users to customize light levels
- Available as cascadable models for a continuous length of lighting, with a minimum of wiring
- Metal housing, shatterproof window
- Easy installation with snap clips, or a choice of magnetic or angle brackets
- Available in AC or DC models
- Available in 285 mm, 570 mm, 850 mm or 1130 mm
- Motion detection models are ideal for locations that cannot use a physical switch or where the placement of the switch is not useful
- Models featuring an eye shield window block direct line of sight to the domed window to increase eye comfort



<b>Operating Voltage</b>	12 to 30 V dc (dc models) 90 to 264 V ac (ac models)
<b>Lumen Output</b>	≈ 650/ft
<b>LED Lifetime</b>	50,000 hours
<b>Color Temperature</b>	Daylight White — 5000 k
<b>Switch</b>	High = 100% intensity Low = 50% intensity
<b>Environmental Rating</b>	IP50 — Dry location only
<b>Certifications</b>	



Length (mm)	Lumens (Typical @ 25 °C)	AC Models Typical Wattage* (Watts)	DC Models Typical Wattage* (Watts)
	Daylight White		
285	750	9	7.4
570	1500	18	14.8
850	2250	27	22.2
1130	3000	36	29.6

\* Typical operating wattage is measured at 120 V ac or 24 V dc, depending on model

## AC Cascade and Power Cordsets

(DC Cascade and Power cordsets shown on page 25)



1 Power Cordset  
1.8 m (6')

<b>LQMAC-306</b>	Flying Leads
<b>LQMAC-306B</b>	North & Central America, Japan, Taiwan
<b>LQMAC-306D</b>	India, Sri Lanka, Nepal, Namibia
<b>LQMAC-306EF</b>	France, Belgium, Slovakia, Tunisia, Germany, Austria, Netherlands, Spain, S. Korea
<b>LQMAC-306G</b>	UK, Ireland, Cyprus, Malta, Malaysia, Singapore, Hong Kong, Vietnam
<b>LQMAC-306I</b>	Australia, New Zealand, Papua New Guinea, Argentina, China
<b>LQMAC-306N</b>	Brazil

2 Double-Ended Cascading Cordset  
Male straight/Male straight connectors

<b>LQMAEC-3005SS</b>	0.15 m (0.5')
<b>LQMAEC-301SS</b>	0.31 m (1.0')
<b>LQMAEC-303SS</b>	0.91 m (3.0')



LMBWLB32

LMBWLB32-180S

LMBWLB32MAG

LMBWLB32U

LMBWLB32UT



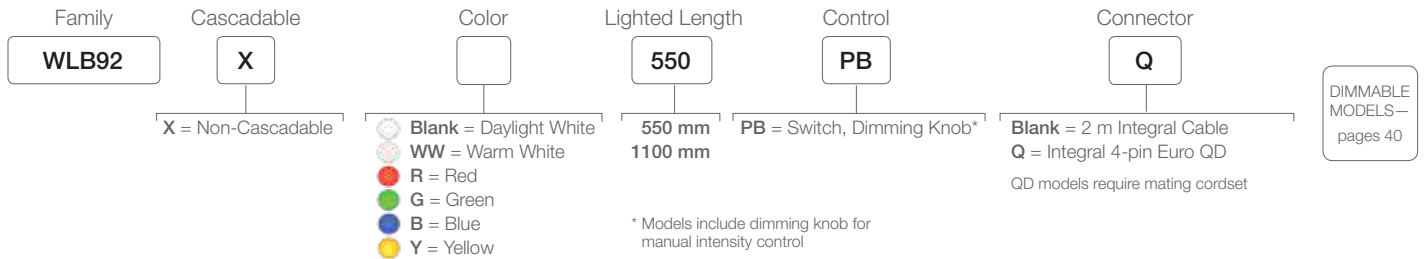
## WLB92 Industrial Light Bar

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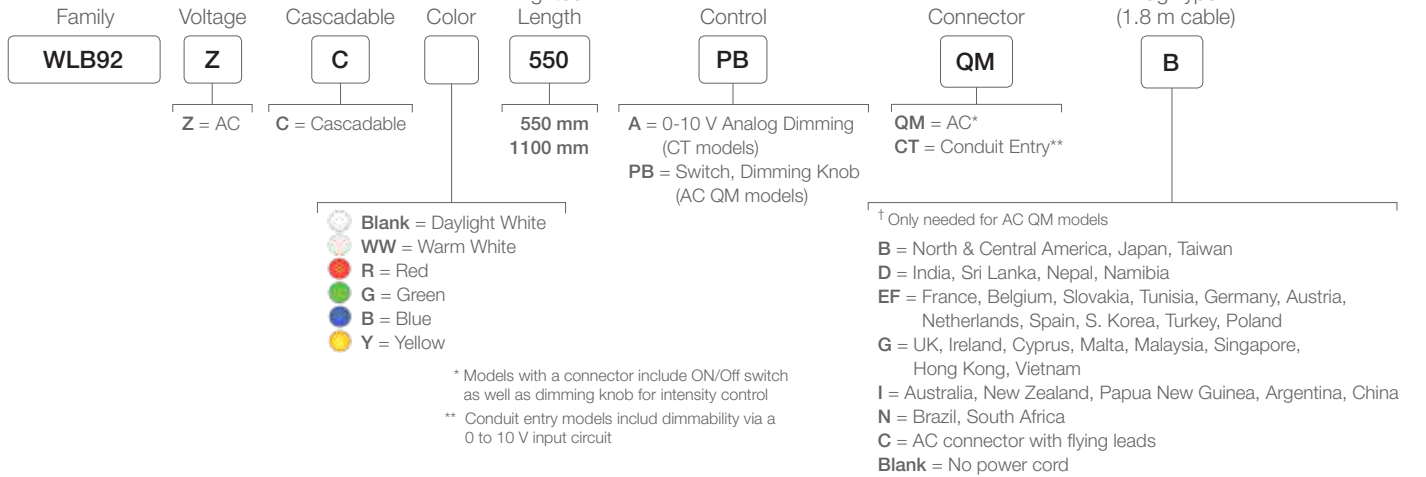
- Increase worker productivity and ergonomics with bright, high-quality, uniform light
- Durable light stands up in your environment with a rugged metal housing and shatterproof light cover
- No maintenance time or cost with long-life, energy-efficient LEDs
- Flexibility to place light where needed with ac and dc models
- Easy installation with variety of mounting options: surface, swivel, snap and hanging brackets
- Available in daylight white, warm white, blue, red, yellow and green
- AC models have a five year warranty



## DC Models



## AC Models



### Operating Voltage

24 V dc (dc models)  
 100 to 277 V ac (ac models)

### Construction

Housing: Anodized aluminum  
 Window: Polycarbonate

### LED Lifetime

50,000 hours

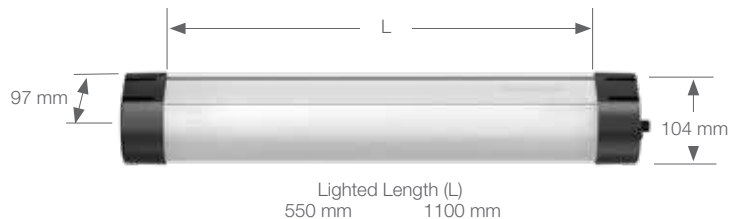
### Color Temperature

Daylight White — 5000 k  
 Warm White — 3000 k

### Environmental Rating

IEC IP40

### Certifications



Length (mm)	Lumens (Typical @ 25 °C)						AC Models Typical Wattage* (Watts)	DC Models Typical Wattage* (Watts)
	Daylight White	Warm White	Green	Red	Yellow	Blue		
550	3510	3510	1430	745	620	405	34	35
1100	7150	7150	2975	1545	1295	840	70	70

\* Typical operating wattage is measured at 120 V ac or 24 V dc, depending on model



LMBWLB92

LMBWLB92-CLIP

LMBWLB92S



LMBWLB92HK5

LMBWLB92RAS

### AC Power Cordset 1.8 m (6')

for use with models using QM connector.  
 Cascadable model cables available on page 19.



#### LQMAC-306

Flying Leads

#### LQMAC-306B

North & Central America, Japan, Taiwan

#### LQMAC-306D

India, Sri Lanka, Nepal, Namibia

#### LQMAC-306EF

France, Belgium, Slovakia, Tunisia, Germany, Austria, Netherlands, Spain, S. Korea, Turkey, Poland

#### LQMAC-306G

UK, Ireland, Cyprus, Malta, Malaysia, Singapore, Hong Kong, Vietnam

#### LQMAC-306I

Australia, New Zealand, Papua New Guinea, Argentina, China

#### LQMAC-306N

Brazil, South Africa



For use with DC models  
**4-Pin M12/Euro-Style**  
 Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQDC-406RA**)

**MQDC-406**  
 2 m (6.5')  
**MQDC-415**  
 5 m (15')  
**MQDC-430**  
 9 m (30')



## WLS27 LED Strip Lights

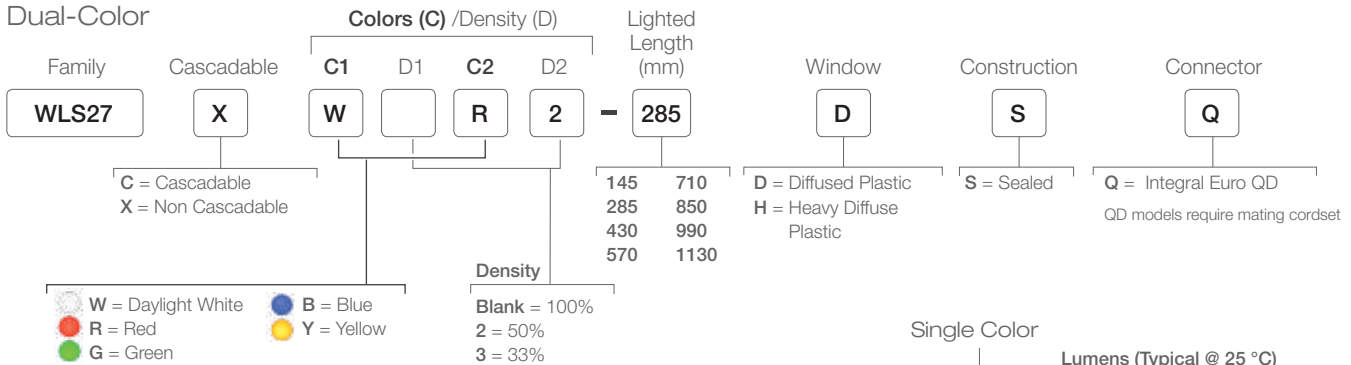
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- Cylindrical shape design, ideal for laminar airflow applications
- Rugged, water-resistant IP66, IP67 and IP69K construction
- Chemically resistant copolyester housing
- Available in eight lengths from 145 mm to 1130 mm
- Daisy chain power to multiple lights
- Capability to dim lights using the wiring pinout (Hi/Lo/Off)
- Optional snap clips for easy installation and repositioning
- Automatic temperature protection built into the unit. Above 50 °C, the light dims to manage heat and protect product lifetime

## Single Color



## Dual-Color



### Single Color

Length (mm)	Lumens (Typical @ 25 °C)					Typical Wattage* (Watts)
	Cool & Warm White	Red	Green	Blue	Yellow	
145	400	55	180	40	50	4
285	800	110	360	80	100	7
430	1200	165	540	120	150	11
570	1600	220	720	160	200	15
710	2000	275	900	200	250	19
850	2400	330	1080	240	300	22
990	2800	385	1260	280	350	26
1130	3200	440	1440	320	400	30

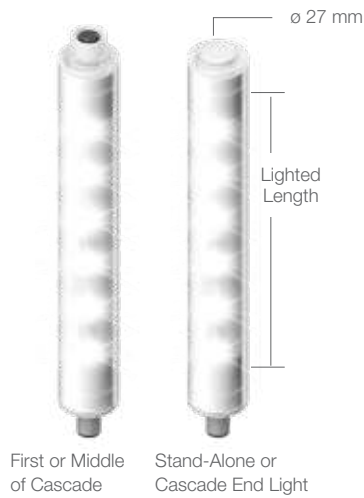
### Dual-Color

Length (mm)	Lumens (Typical @ 25 °C)**					Typical Wattage* (Watts)
	White	Red	Green	Blue	Yellow	
145	238	100	150	55	75	4
285	475	200	300	110	150	7
430	713	300	450	165	225	11
570	950	400	600	220	300	15
710	1188	500	750	275	375	18
850	1425	600	900	330	450	22
990	1663	700	1050	385	525	26
1130	1900	800	1200	440	600	30

\* Typical operating wattage is measured at 24 V dc

\*\* Lumen values lowered by 20% on heavy diffused plastic window models

Supply Voltage	12 to 30 V dc
Construction	Housing: Copolyester
LED Lifetime	Single color: 75,000 hours Dual Color: 50,000 hours
Environmental Rating	IEC IP67, IP66, IP69K per DIN 40050
Operating Temperature	-40 to +70 °C (-40 to +158 °F)
Certifications	



LMBWLS27EC



LMBWLS27H  
Stainless Steel



LMBWLS27T  
Stainless Steel



WLS28-2PBQ  
In-Line Switch with  
M12 connector



LMBWLS27U



LMBWLS27SP



WLS28-2MQ  
In-Line Motion  
Detection Switch with  
M12 connector



1 Power Cordsets  
4 pin M12 Euro-style

1 Power Cordsets - Washdown  
4 pin M12 Euro-style

2 Double-Ended  
(straight male/straight female  
connectors) 4-Pin M12/Euro-Style

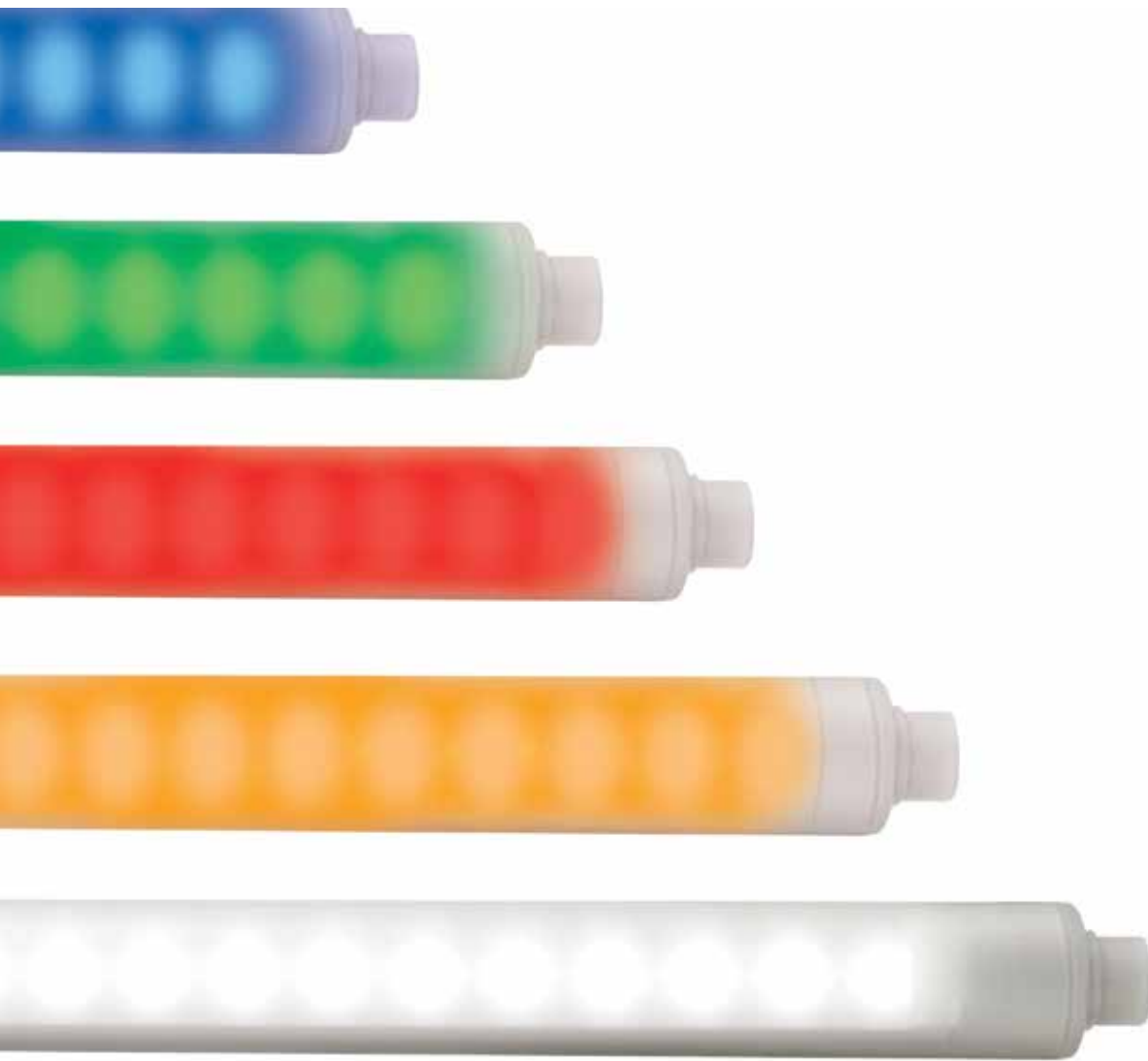
Splitter  
4-Pin M12/Euro-Style

MQDC-406  
MQDC-406RA  
2 m (6.5')

MQDC-WDSS-0406  
2 m (6.5')

MQDEC-401SS  
0.3 m (1')

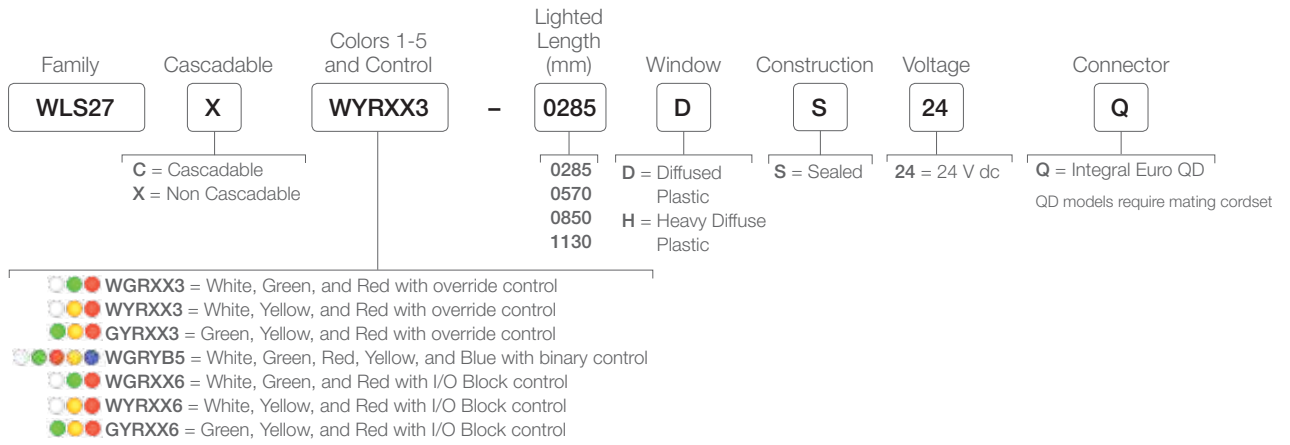
CSB-M1241M1241  
0.3 m (1') male trunk;  
2 x 0.3 m (1') female  
branches



## WLS27 Multicolor LED Strip Lights

---

- Three- and five-color models with EZ-STATUS™ combine illumination and indication in one robust light fixture
- Rugged, water-resistant IEC IP69K rating
- Four available lengths from 285 mm to 1130 mm
- Daisy chain power to multiple lights



Supply Voltage: 24 V dc

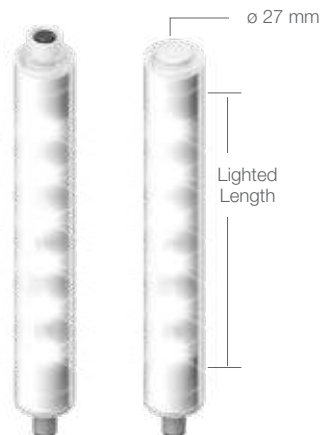
Construction: Housing: Copolyester

LED Lifetime: 50,000 hours

Environmental Rating: IEC IP66, IP67, IP69K per DIN 40050

Operating Temperature: -40 to +50 °C (-40 to +122 °F)

Certifications:



First or Middle of Cascade      Stand-Alone or Cascade End Light

Length (mm)	Lumens (Typical @ 25 °C)*					Typical Wattage** (Watts)
	White	Red	Green	Blue	Yellow	
285	650	185	400	125	570	7
570	1300	370	800	250	1140	12
850	1950	555	1200	375	1710	22
1130	2600	740	1600	500	2280	30

\* Lumen values lowered by 20% on heavy diffused plastic window models  
 \*\* Typical operating wattage is measured at 24 V dc

Accessories are listed on pages 26



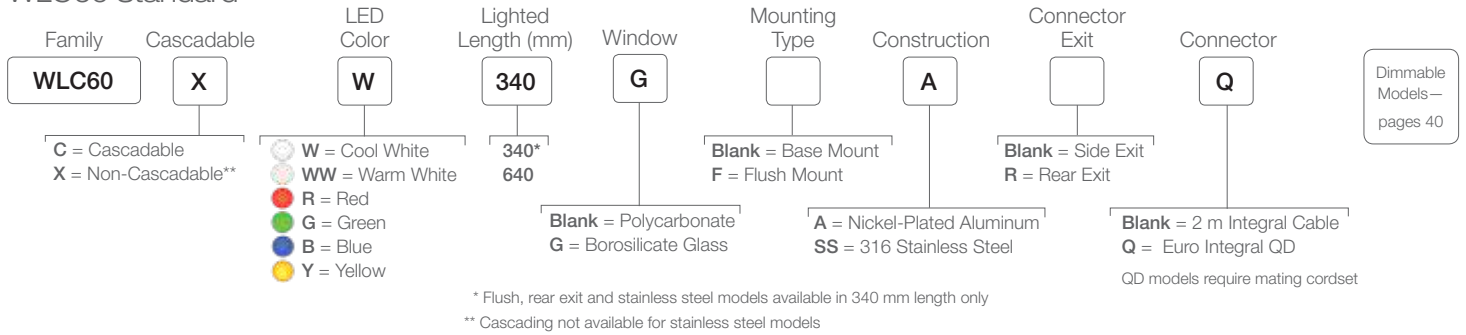


## Heavy-Duty LED Lights

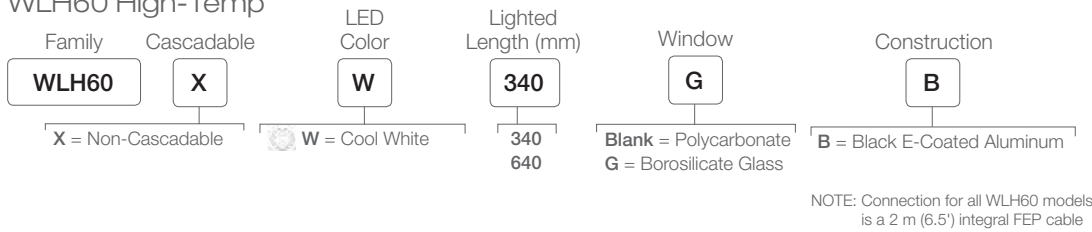
---

- Oil, chemical, and water resistant with IP67, IP68g, and IP69K ratings
- High brightness paired with advanced glare-reducing optics
- Easy-to-install with a wide variety of mounting solutions
- Resistant to vibration and shock
- Input voltage of 12–30 V dc
- Models have four discrete intensity level settings
- Available with stainless steel or nickel-plated aluminum housing
- High temperature models now available in a black E-coated aluminum housing

## WLC60 Standard



## WLH60 High-Temp

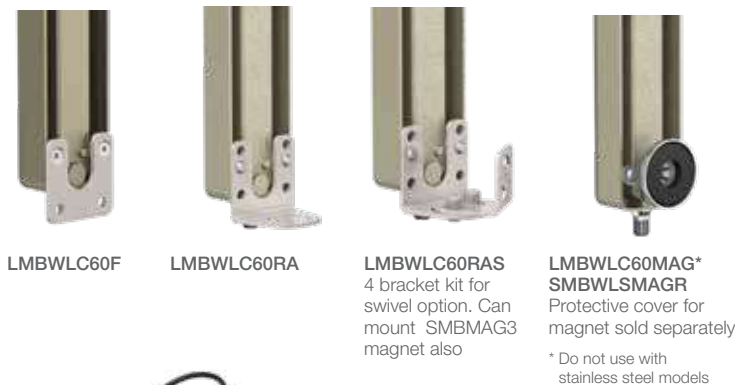
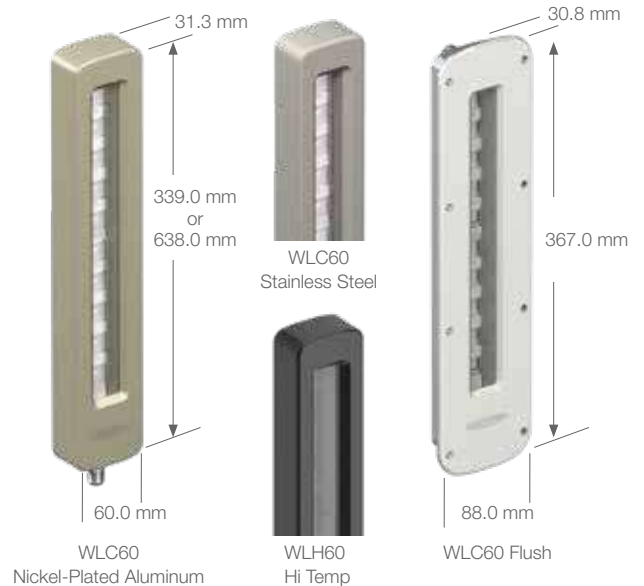


<b>Supply Voltage</b>	WLC60: 12 to 30 V dc    WLH60: 21 to 28 V dc
<b>Construction</b>	WLC60 Housing: Nickel-plated aluminum or 316 Stainless steel WLH60 Housing: Black electro-coated aluminum Window: Polycarbonate or Borosilicate Glass
<b>Environmental Rating</b>	Rated IEC IP68, IP68g, IP69K per DIN 40050
<b>Operating Temperature</b>	WLC60: -40 to +70 °C (-40 to +158 °F) WLH60: -40 to +100 °C (-40 to +212 °F)
<b>Certifications</b>	

Length (mm)	WLC60 Lumens (Typical @ 25 °C)		Length (mm)	WLH60 Lumens (Typical @ 25 °C)	
	Cool White	Typical Wattage* (Watts)		Cool White	Typical Wattage* (Watts)
340	1300	14.2	340	1150	14.2
640	2600	28.1	640	2300	28.1

\*Typical operating wattage is measured at 24 V dc

\*Typical operating wattage is measured at 24 V dc



**PSD-24-4**  
**Class 2 Power Supply**  
Input: 90-264 V ac 1.5A  
Output: 24 V dc 3.9A  
2 m (6.5') 4-Pin Euro Connector

**4-Pin M12/Euro-Style**  
Straight connector models listed; for right-angle, add RA to the end of the model number (example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')

**4-Pin M12/Euro-Style**  
Double-Ended (straight male/straight female connectors)

**MQDEC-401SS-PUR**  
0.3 m (1')  
**MQDEC-403SS-PUR**  
1 m (3')  
**MQDEC-406SS-PUR**  
2 m (6.5')

**4-Pin M12/ Euro-Style Washdown**  
Straight connector models only

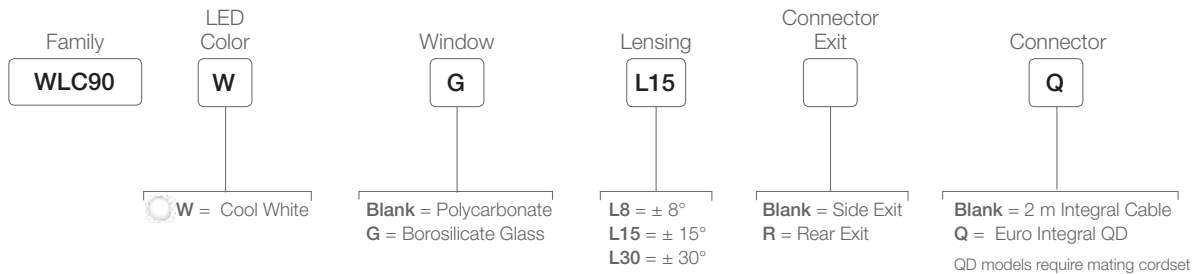
**MQDC-WDSS-0406**  
2 m (6.5')  
**MQDC-WDSS-0415**  
5 m (15')  
**MQDC-WDSS-0430**  
9 m (30')





## WLC90 Heavy-Duty LED Light

---

- Oil, chemical and water resistant with IP67, IP68g and IP69K ratings
- Vast operating temperature range internal monitoring circuit dims the LEDs to a safe level at extreme temperatures
- Three lens choices to suit many application needs
- Pan-and-tilt brackets for versatile mounting to direct the light in any direction
- Models have three discrete intensity level settings

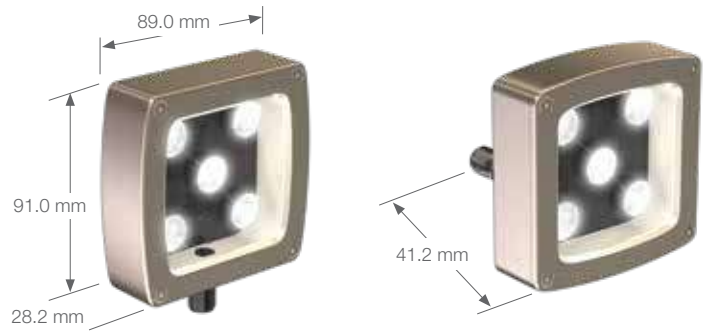


DIMMABLE  
MODELS—  
pages 40

Supply Voltage	12 to 30 V dc
Construction	Housing: Nickel-plate aluminum Window: polycarbonate or borosilicate glass
Environmental Rating	Rated IEC IP68, IP68g, IP69K per DIN 40050
Operating Temperature	-40 to +70 °C (-40 to +158 °F)
Certifications	 

Lumens (Typical @ 25 °C)	Typical Wattage* (Watts)
Cool White	
625	8.1

\*Typical operating wattage is measured at 24 V dc



Rear-Exit Models



Side-Exit Models



SMBAMS70AS

LMBWLC90PT



4-Pin M12/Euro-Style  
Straight connector models listed; for right-angle, add RA to the end of the model number (example, MQDC-406RA)

- MQDC-406  
2 m (6.5')
- MQDC-415  
5 m (15')
- MQDC-430  
9 m (30')



4-Pin M12/ Euro-Style Washdown  
Straight connector models only

- MQDC-WDSS-0406  
2 m (6.5')
- MQDC-WDSS-0415  
5 m (15')
- MQDC-WDSS-0430  
9 m (30')



PSD-24-4  
Class 2 Power Supply  
Input: 90-264 V ac 1.5A  
Output: 24 V dc 3.9A  
2 m (6.5') 4-Pin Euro Connector

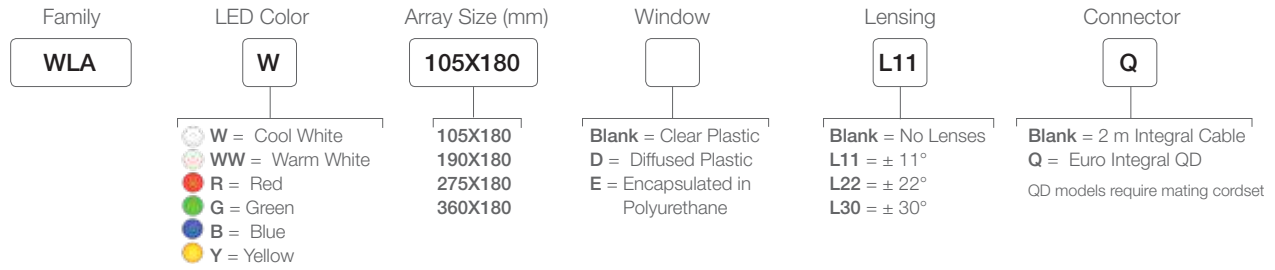


## WLA LED Area Lights

---

- High power solid state LED array with cool white, warm white, red, green, blue or yellow light
- Illuminates a large area with an even pattern of light and no shadows
- Available in four sizes
- Designed for area and machine lighting
- Rugged thermoplastic housing rated to IP69K
- Lensed models provide a concentrated, intense light beam
- Cabled and Quick Disconnect models available





DIMMABLE MODELS— pages 40

**Supply Voltage** | 12 to 30 V dc

**Construction** | Housing: PBT  
Window: Acrylic or polyurethane  
Connector: Nickel-plated brass or PVC-jacketed cable

**Environmental Rating** | Rated IEC IP67 and IP69K, per DIN 40050

**Operating Temperature** | -20 to +50 °C (-4 to +122 °F)

**Certifications** | Encapsulated models not UL listed

Size (mm)	Lumens* (Typical @ 25 °C)						Typical Wattage** (Watts)
	Cool White	Warm White	Red	Green	Blue	Yellow	
105x180	550	435	125	325	95	275	9.6
190x180	1100	870	250	650	190	550	19.2
275x180	1650	1305	375	975	285	825	28.8
360x180	2200	1740	500	1300	380	1100	38.4

\* Lumen values lowered by 35% on diffused window models  
\*\*Typical operating wattage is measured at 24 V dc



**4-Pin M12/Euro-Style**  
Straight connector models listed; for right-angle, add RA to the end of the model number (example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')

**4-Pin M12/ Euro-Style Washdown**  
Straight connector models only

**MQDC-WDSS-0406**  
2 m (6.5')  
**MQDC-WDSS-0415**  
5 m (15')  
**MQDC-WDSS-0430**  
9 m (30')





## WL50S LED Spot Lights

---

- Highly concentrated, focused light available in three colors (white, red, or green)
- Lenses come in three angles to cover area of concentration
- Illuminates a large area with an even pattern of light and no shadows
- 12 to 30 V dc operation
- Cabled and quick-disconnect models available
- 56 mm diameter with flat profile and 30 mm mounting base
- Rugged sealed housing rated to IP69K
- Available in a chemically resistant 316 stainless steel housing for use in harsh environments

Family  
**WL50S**

Black  
Anodized  
Aluminum

LED Color  
**W**

W = White  
G = Green  
R = Red

Lens Angle  
**L11**

L5 = ±5° (small)  
L11 = ±11° (large)  
L20 = ±20° (largest)

Connector  
**Q**

Blank = 2 m Integral Cable  
Q = Euro Integral QD  
QD models require mating cordset

Family  
**WL50S**

Stainless  
Steel

LED Color  
**W**

W = White  
G = Green  
R = Red

Housing  
**SS**

SS = Stainless  
Steel

Window Material  
**G**

Blank = Acrylic  
G = Glass

Lens Angle  
**L11**

L5 = ±5° (small)  
L11 = ±11° (large)  
L20 = ±20° (largest)

Connector  
**Q**

Q = Euro Integral QD  
QD models require mating cordset

Dimmable  
Models—  
pages 40

**Supply Voltage**

12 to 30 V dc

**Construction**

Housing: Black anodized aluminum or  
Stainless Steel with FDA-grade silicone  
gasket and Viton® o-ring seal  
Window: Polycarbonate or glass window  
Connector: Nickel-plated QD connector or  
PVC-jacketed cable  
Mounting Nut: Black zinc-plated steel or Stainless  
Steel mounting nut

**Environmental Rating**

IEC IP67, IP69K per DIN 40050

**Operating Temperature**

-20 to +50 °C (-4 to +122 °F)

**Certifications**



Lens	Lumens (Typical @ 25 °C)			Typical Wattage* (Watts)
	Cool White	Green	Red	
±5°	295	210	110	4.3
±11°	285	200	105	
±20°	270	190	100	

\*Typical operating wattage is measured at 24 V dc



**4-Pin M12/Euro-Style**  
Straight connector models  
listed; for right-angle, add RA  
to the end of the model number  
(example, MQDC-406RA)

MQDC-406  
2 m (6.5')  
MQDC-415  
5 m (15')  
MQDC-430  
9 m (30')

**4-Pin M12/ Euro-Style  
Washdown**  
Straight connector models only

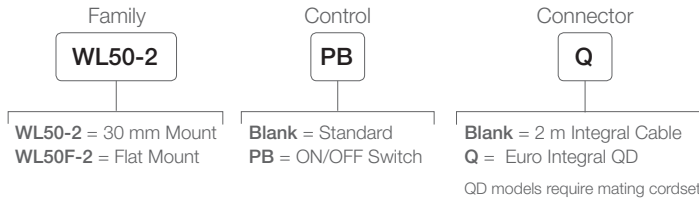
MQDC-WDSS-0406  
2 m (6.5')  
MQDC-WDSS-0415  
5 m (15')  
MQDC-WDSS-0430  
9 m (30')






## WL50-2 LED Work Lights

---

- Designed for enclosure or area lighting use with an optional flex arm mount for adjustable, industrial task lighting
- Standard or push-button models available
- Flat-mount or 30 mm base-mount models available
- Rugged, sealed polycarbonate housing rated to IP69K (standard models) or IP67 (push-button models)
- 12 to 30 V dc operation
- Cabled and quick-disconnect models available
- Low power consumption less than 3 watts



Dimmable  
Models—  
pages 40

<b>Supply Voltage</b>	12 to 30 V dc
<b>Construction</b>	Housing: Polycarbonate Connector: Nickel-plated brass or PVC-jacketed cable
<b>Environmental Rating</b>	Standard Models: IP69K per DIN 40050 Push-Button Models: IEC IP67
<b>Operating Temperature</b>	-40 to +50 °C (-40 to +122 °F)
<b>Certifications</b>	  



Lumens (Typical @ 25 °C)	Typical Wattage* (Watts)
<b>Cool White</b>	
185	2.4

\*Typical operating wattage is measured at 24 V dc

#### Mounting Options for Flat Mount Models



VELCRO® Brand  
VELCOIN® Fasteners  
(included)

#### Mounting Options for 30 mm Mount Models



**FLX18 Flex Arm Mounts**  
See page 42 for more information



**4-Pin M12/  
Euro-Style**  
straight connector models listed;  
for right-angle models, add RA  
to the end of the model number  
(example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')





LC6P1T shown

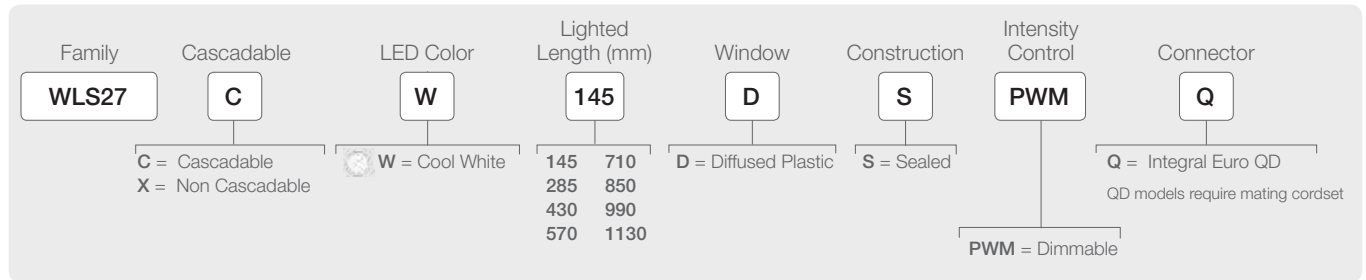
# LED Dimming Controller & Dimmable LED Lights

- Works with special models of the strip lights, heavy-duty lights, area lights, spot lights and work lights
- High-frequency modulation allows for precise intensity control and flicker-free illumination
- Allows for control of multiple lights with one module
- LED Pulse-Width Modulation (PWM) versions of LED lights can be controlled by other PWM output devices as well as Banner's controller
- Ability to control intensity from zero to 100 percent to suit the level required for the application
- Helps further increase energy savings, helping to reduce overall energy costs

## WLS27 LED Strip Lights



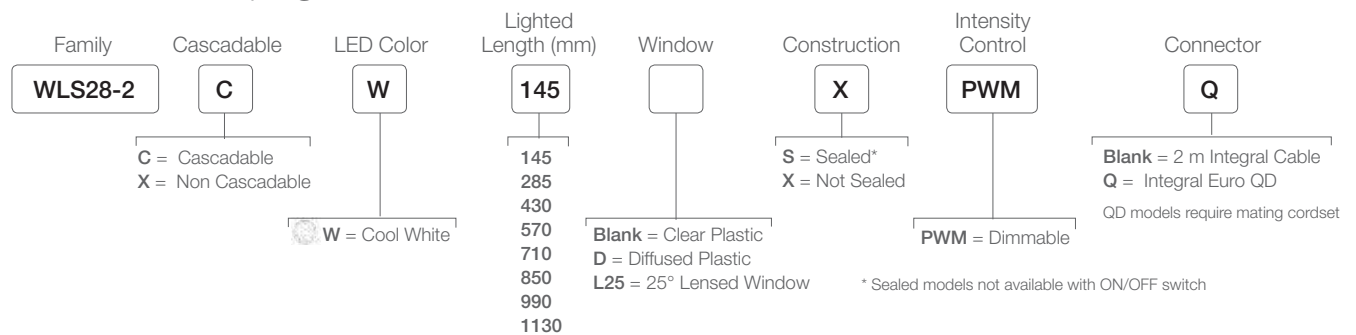
page 26



## WLS28-2 LED Strip Lights



page 16



## WLB92 DC Models



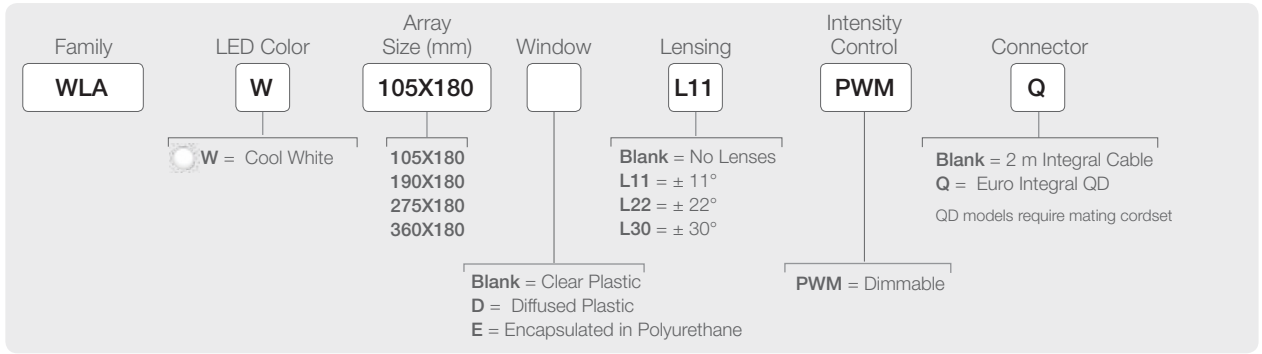
page 24





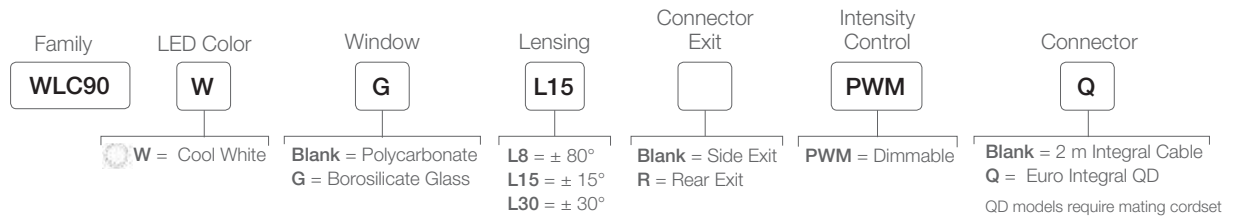
page 34

## WLA LED Area Lights



page 32

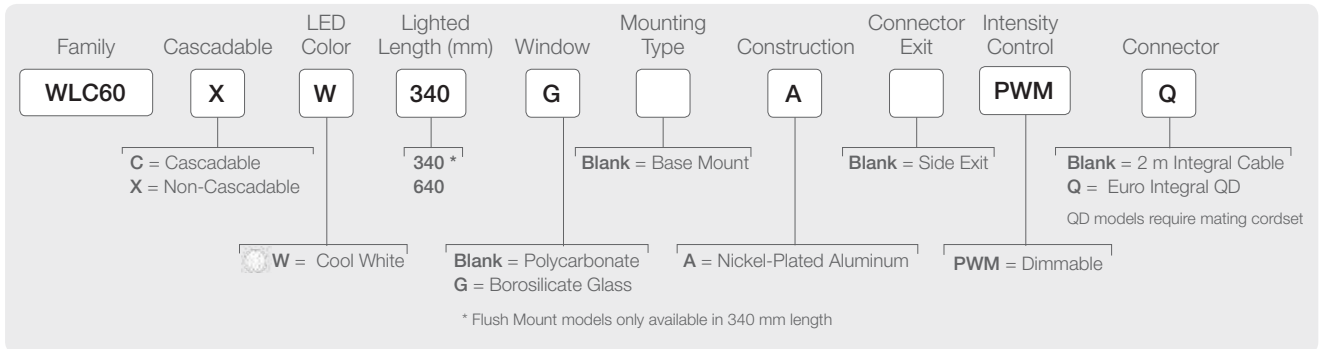
## WLC90 Heavy-Duty LED Light



## WLC60 Heavy-Duty LED Light



page 30



page 36



page 38



















WL50S and WL50-2 also have the PWM option available. Contact factory for more information.



## Flex Arm

---

- Versatile mounting options including magnetic mount, clamp mount and flange mount
- Vinyl coated to protect against moisture
- Adjustable arm allows for easy repositioning of light to suit many application needs
- Concentrate light exactly where needed
- Portability with magnetic and clamp mount options
- Available for use with spot lights, work lights and vision spot lights

Models	Base Connection	Light Connection	Brackets		
FLX18-1212	 1/2-14 NPSM	 1/2-14 NPSM (Male) Use with: WL50-2 WL50-2PB	 SMB22	 SMBFLXMAG	 LMB12RA
FLX18-F12	 3-Hole Flange	 1/2-14 NPSM (Male) Use with: WL50-2 WL50-2PB	Direct Mount		
FLX18-12M30	 1/2-14 NPSM	 M30 x 1.5 (Female) Use with: WL50-2 WL50-2PB WL50S	 SMB22	 SMBFLXMAG	 LMBE12RA
FLX18-DM30	 2 x 1/4-20W 1.375 spacing	 M30 x 1.5 (Female) Use with: WL50-2 WL50-2PB WL50S	 SMBFLXCLAMPD	 SMBFLXMAGD	
FLX18-FM30	 3-Hole Flange	 M30 x 1.5 (Female) Use with: WL50-2 WL50-2PB WL50S	Direct Mount		









# Signal Tower Lights

Multi-segment LED tower lights give machines a voice, conveying critical information in a clear, visual manner. AC and DC voltage, fourteen color options, six audible alarm styles, multiple intensity levels, three connection types and optional wireless or IO-Link communication give almost limitless possibilities in both preassembled and field configured units.

# Selection Guide



Tower Lights

Page	48	52	54	56	58
Family Name	TL70	TL50	TL50C	TL50BL	CL50
DC or AC Power	AC or DC	AC or DC	AC or DC	AC or DC	AC or DC
Audible Options					
Daylight Visible					
Segment Diameter (mm)	70	50	50	50	50
Mounting Hole Diameter (mm)	30	30	30	30	30
Multiple Colors per Light Segment					
IP Rating	IP65	IP67	IP67	IP67	IP67
IO-Link					
Wireless					
Modular Construction					



TL50



TL70 Wireless



CL50



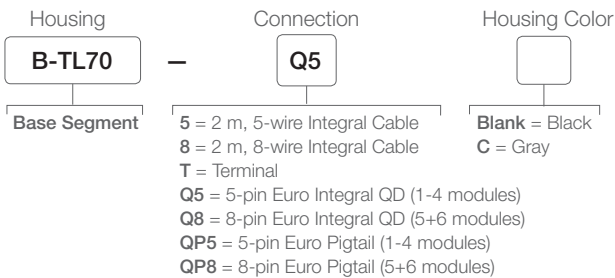
## TL70 Tower Lights

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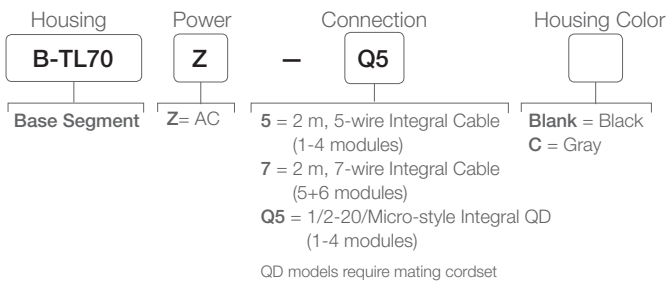
- 70 mm diameter with bright, colored LEDs for long range visibility
- Light segments appear gray when off to eliminate false indication from ambient light
- Modular design and simple wiring for fast field configuration; preassembled models also available
- Rugged, water-resistant IP65 housing with UV stabilized material
- Top-mounted audible modules from 75 to 101 dB, including multi-tone and programmable audible models allow for custom alerts or announcements; all work with the same standard bases
- Wireless base and segment models quickly enable remote monitoring and control of status lights; unleash IIOT capability
- Match your machine with a choice of black or gray housing

# Build Your Own Tower Light

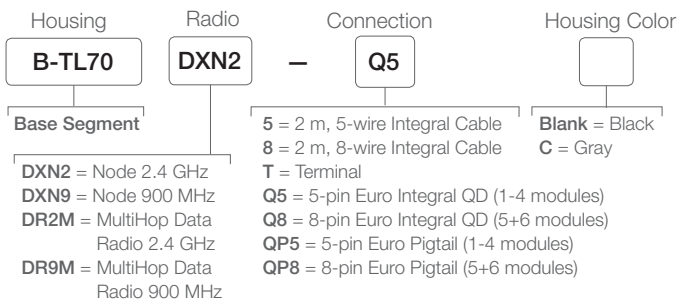
## Standard Base



## AC Base

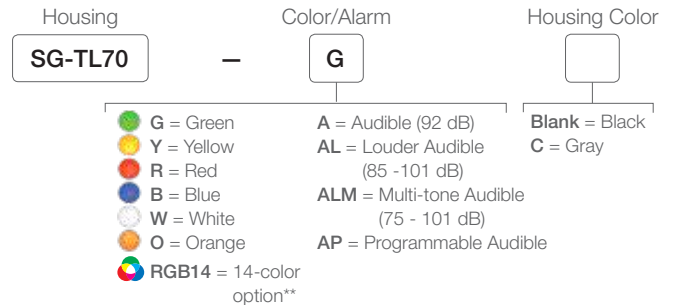


## Wireless Base

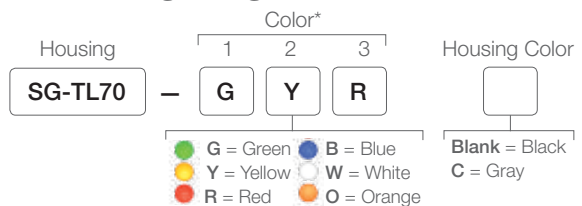


\* To have color name etched on a segment, add -L to the end of the model number

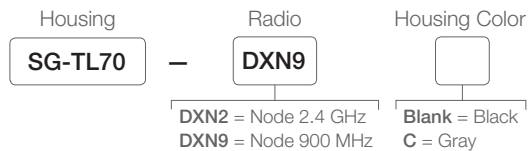
## Single-Color Light Segments



## Multicolor Light Segments



## Wireless Communication Segment



\*\* Green, Yellow, Red, Blue, White, Cyan, Magenta, Orange, Amber, Lime Green, Spring Green, Sky Blue, Violet and Rose



The wireless communication segment quickly twists onto any TL70 base, enabling remote monitoring and control without requiring constant power or expensive wiring.



# Order a Preassemble Tower Light

## Preassembled TL70

Housing	Color**/Position						Audible*	Housing Color	Connection
<b>TL70</b>	1	2	3	4	5	6	<input type="checkbox"/>	<input type="checkbox"/>	<b>Q</b>
	<b>G</b>	<b>Y</b>	<b>R</b>	<b>B</b>	<b>W</b>	<b>O</b>			
	G = Green	Y = Yellow	R = Red	B = Blue	W = White	O = Orange		<b>Blank</b> = Black <b>C</b> = Gray	<b>Blank</b> = 2 m Integral Cable <b>T</b> = Terminal Wired <b>Q</b> = Euro Integral QD <b>QP</b> = Euro Pigtail QD QD models require mating cordset
	<b>Blank</b> = None <b>A</b> = Audible (92 dB) <b>AL</b> = Louder Audible (85 - 101 dB) <b>ALM</b> = Multi-tone Audible** (75 - 101 dB) <b>AP</b> = Programmable Audible								
	* For audible only, leave colors blank								
	** Not available with 6 light models								

## Preassembled TL70 AC

Housing	Color**/Position						Audible*	Housing Color	Connection
<b>TL70Z</b>	1	2	3	4	5	6	<input type="checkbox"/>	<input type="checkbox"/>	<b>Q</b>
	<b>G</b>	<b>Y</b>	<b>R</b>	<b>B</b>	<b>W</b>	<b>O</b>			
	G = Green	Y = Yellow	R = Red	B = Blue	W = White	O = Orange		<b>Blank</b> = Black <b>C</b> = Gray	<b>Blank</b> = 2 m Integral Cable <b>Q</b> = 1/2-20/Micro-style Integral QD QD models require mating cordset
	<b>Blank</b> = None <b>A</b> = Audible (92 dB) <b>AL</b> = Louder Audible (85 - 101 dB) <b>ALM</b> = Multi-tone Audible** (75 - 101 dB) <b>AP</b> = Programmable Audible								
	* For audible only, leave colors blank								
	** Not available with 6 light models								

## Preassembled TL70 Wireless

Housing	Radio	Color**/Position						Audible*	Housing Color	Connection
<b>TL70</b>	<b>DXN2</b>	1	2	3	4	5	6	<input type="checkbox"/>	<input type="checkbox"/>	<b>Q</b>
		<b>G</b>	<b>Y</b>	<b>R</b>	<b>B</b>	<b>W</b>	<b>O</b>			
	<b>DXN2</b> = Node 2.4 GHz <b>DXN9</b> = Node 900 MHz <b>DR2M</b> = MultiHop Data Radio 2.4 GHz <b>DR9M</b> = MultiHop Data Radio 900 MHz	G = Green	Y = Yellow	R = Red	B = Blue	W = White	O = Orange	<b>Blank</b> = None	<b>Blank</b> = Black <b>C</b> = Gray	<b>Blank</b> = 2 m Integral Cable <b>Q</b> = Euro Integral QD <b>QP</b> = Euro Pigtail QD QD models require mating cordset
		<b>Blank</b> = None <b>A</b> = Audible (92 dB) <b>AL</b> = Louder Audible (85 - 101 dB) <b>ALM</b> = Multi-tone Audible** (75 - 101 dB) <b>AP</b> = Programmable Audible								
		* For audible only, leave colors blank								
		** Not available with 6 light models								



Laser  
Marking  
Available

Color Count	AC Tower Height (H)	AC Tower Height with Audible (H)	DC Tower Height (H)	DC Tower Height with Audible (H)
1	155.6 mm	212.3 mm	87.6 mm	144.3 mm
2	205.3 mm	262.0 mm	137.3 mm	194.0 mm
3	255.0 mm	311.7 mm	187.0 mm	243.7 mm
4	304.7 mm	361.4 mm	236.7 mm	293.4 mm
5	354.4 mm	411.1 mm	286.4 mm	343.1 mm
6	404.1 mm	NA	336.1 mm	NA

**Supply Voltage**

12 to 30 V dc  
100 to 240 V ac

**Construction**

Bases and Covers: Polycarbonate  
Light Segment: Polycarbonate

**Environmental Rating**

IP65

**Operating Temperature**

-40 to +50 °C (-40 to +122 °F)

**Certifications**



Accessories are listed on pages 61



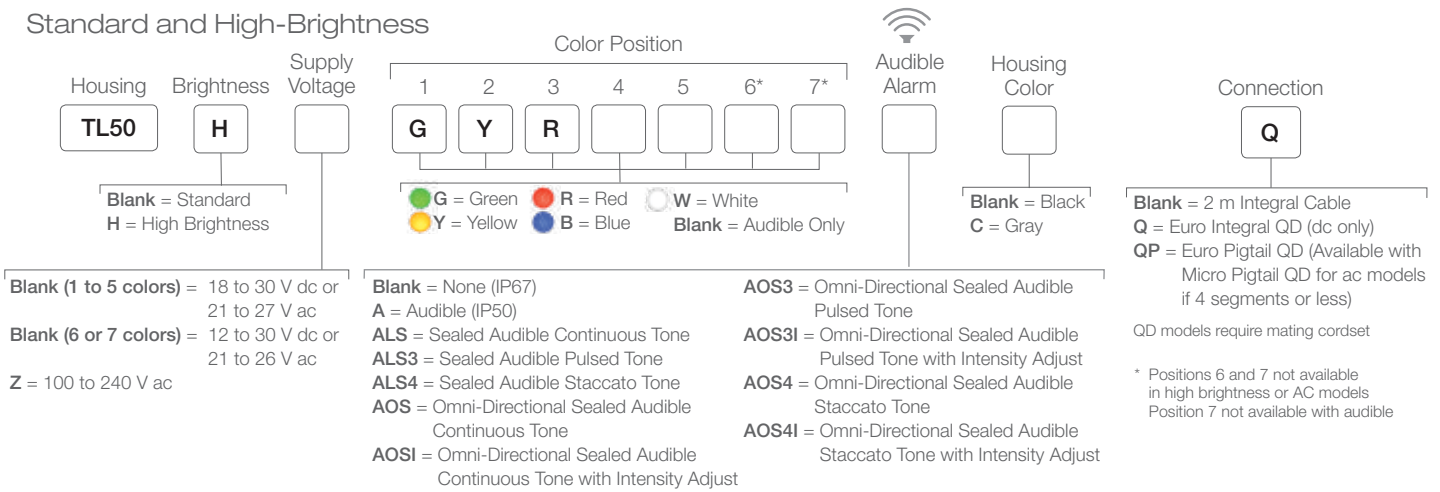
## TL50 Tower Lights

---

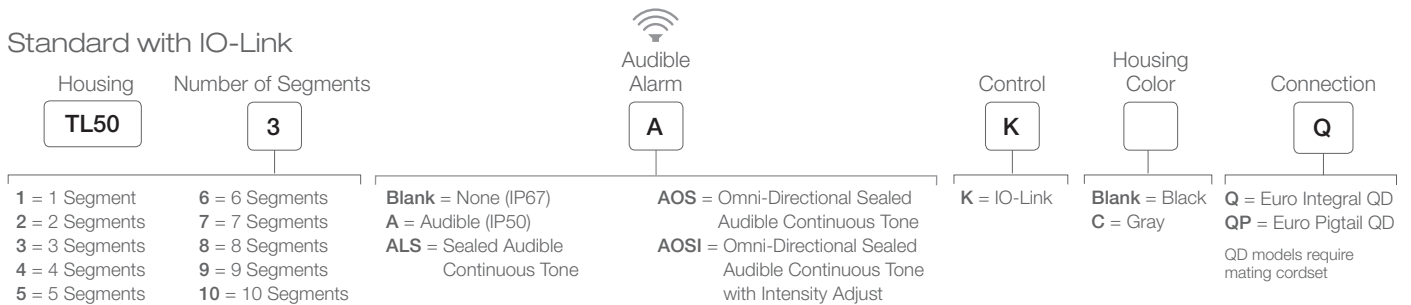
- Available in models featuring IO-Link communication for easy integration into most industrial networks and remote control and monitoring of light and audible segments in the fixture
- Built-to-order configure your model today using our online tool
- Installs directly on machine quickly and easily with pre-wired or quick-disconnect options no assembly required
- Features a completely self-contained design no controller needed
- Displays up to 7 colors in a single tower choice of 10 colors in standard brightness and 5 colors in high brightness tower lights
- Allows multiple lights to be on simultaneously
- Eliminates false indication from ambient light; indicators appear gray when off
- Available in Universal AC Voltage models



## Standard and High-Brightness



## Standard with IO-Link



<b>Supply Voltage</b>	18 to 30 V dc or 21-27 V ac; 100 to 240 V ac >5 segments: 12-30 V dc or 21-26 V ac
<b>Construction</b>	Bases and Covers: ABS Light Segment: Polycarbonate
<b>Environmental Rating</b>	General-Purpose and Sealed Audible: IEC IP67 Standard Audible: IEC IP50
<b>Operating Temperature</b>	General-Purpose: -40 to +50 °C (-40 to +122 °F) Standard and Sealed Audible: -20 to +50 °C (-4 to +122 °F)
<b>Certifications</b>	CE, UL LISTED

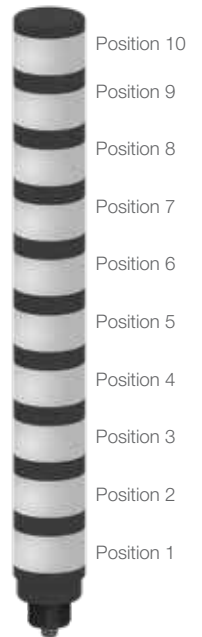


**Audible**  
max. intensity 92 db @ 1 meter (typical)

**Sealed Audible**  
max. intensity 94 db @ 1 meter (typical)

**Sealed Omni-Directional Audible**  
Standard: max. intensity 99 db @ 1 meter (typical)  
Intensity Adjust: max. intensity 95 db @ 1 meter (typical)

Laser Marking Available



Tower Height (H)	Tower Height (H)			100 to 240 V AC
	General-Purpose IP67	Audible IP50	Sealed Audible IP67	
0	—	92.0 mm	74.4 mm	88.4 mm
1	61.2 mm	92.0 mm	115.1 mm	129.1 mm
2	101.9 mm	132.7 mm	155.8 mm	169.8 mm
3	142.6 mm	173.4 mm	196.5 mm	210.5 mm
4	183.3 mm	214.1 mm	237.2 mm	251.2 mm
5	224.0 mm	254.8 mm	277.9 mm	291.1 mm
6	264.7 mm	295.5 mm	318.6 mm	332.6 mm
7	305.4 mm	339.2 mm	359.3 mm	373.3 mm
8	346.1 mm	379.9 mm	400.0 mm	414.0 mm
9	386.8 mm	420.6 mm	440.7 mm	454.7 mm
10	427.5 mm	461.3 mm	481.4 mm	495.4 mm

Add 69 mm to any of these heights to get total height

Area in gray are IO-Link models only. Not available in AC.

Accessories are listed on pages 61



## TL50C Compact Tower Lights

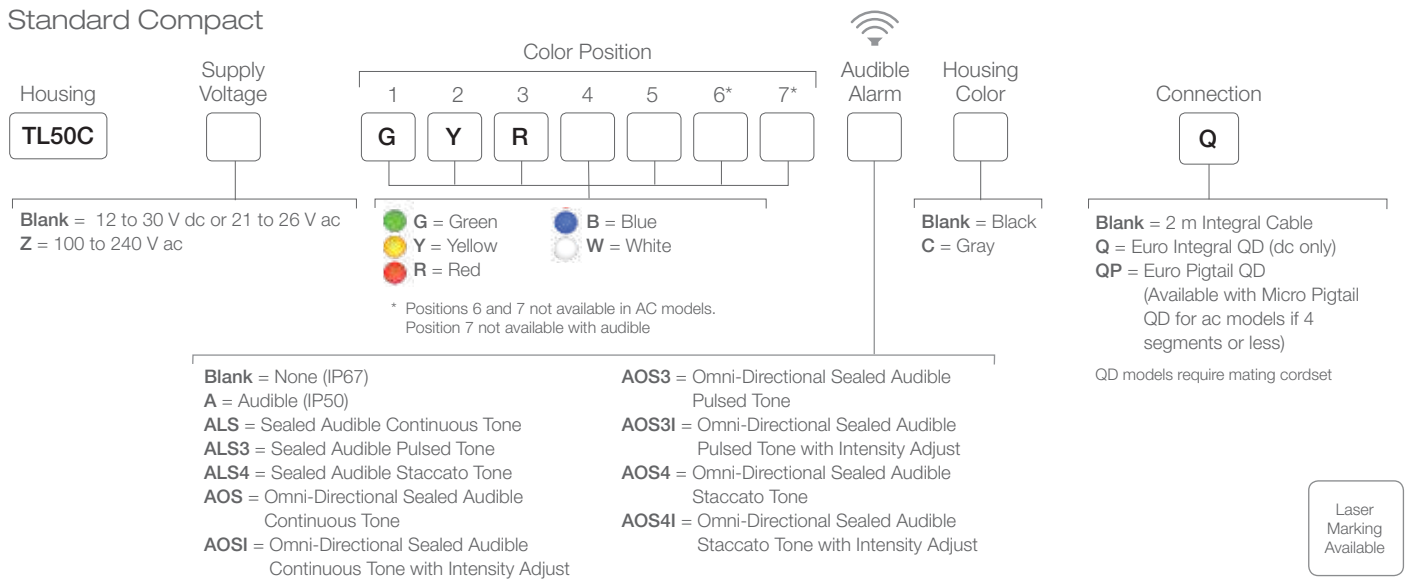
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- Ideal for status indication on small to mid-size pieces of equipment
- Displays up to five stacked colors in one tower with universal ac voltage and up to seven stacked colors in one tower with standard dc voltage
- Half the height of standard TL50 models
- Bright, uniform lighted segments with 10 color choices available
- Available with standard, sealed or Omni-Directional audible
- Compact, sleek, rugged design with IP67 models available
- DC models work down to 12 volts, allowing for use in battery-powered mobile equipment

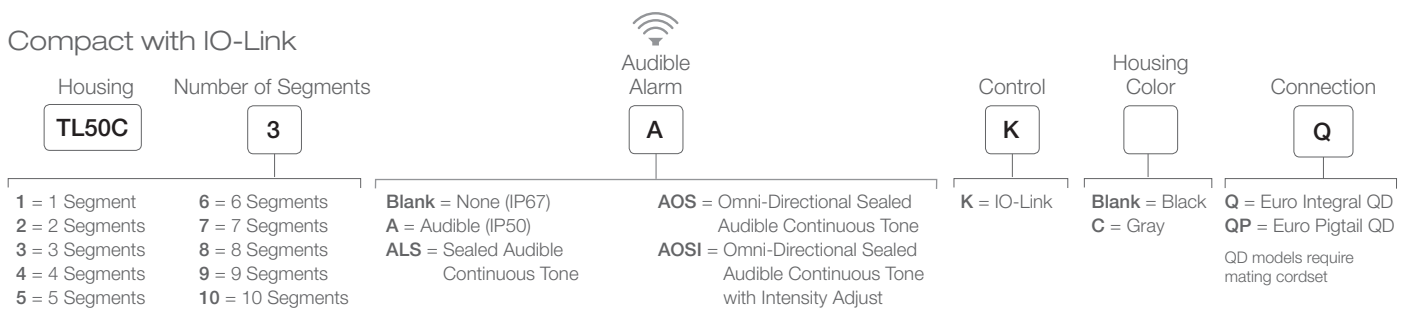




## Standard Compact



## Compact with IO-Link



**Supply Voltage** 12 to 30 V dc or 21-27 V ac; 100 to 240 V ac

**Construction** Bases and Covers: ABS  
Light Segment: Polycarbonate

**Environmental Rating** General-Purpose and Sealed Audible: IEC IP67  
Standard Audible: IEC IP50

**Operating Temperature** General-Purpose: -40 to +50 °C (-40 to +122 °F)  
Standard and Sealed Audible: -20 to +50 °C (-4 to +122 °F)

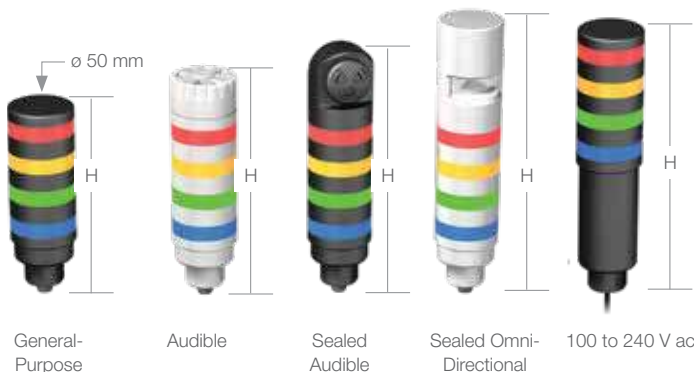
**Certifications**



**Audible**  
max. intensity 92 db @ 1 meter (typical)

**Sealed Audible**  
max. intensity 94 db @ 1 meter (typical)

**Sealed Omni-Directional Audible**  
Standard: max. intensity 99 db @ 1 meter (typical)  
Intensity Adjust: max. intensity 95 db @ 1 meter (typical)



	Tower Height (H)				100 to 240 V AC
	General-Purpose IP67	Audible IP50	Sealed Audible IP67	Sealed Omni-Directional	
1	46.2 mm	77.1 mm	100.2 mm	114.2 mm	
2	72.0 mm	102.9 mm	126.0 mm	140.0 mm	
3	97.8 mm	128.7 mm	151.8 mm	165.8 mm	
4	123.6 mm	154.5 mm	177.6 mm	191.6 mm	
5	149.4 mm	180.3 mm	203.4 mm	217.4 mm	
6	175.2 mm	206.1 mm	229.2 mm	243.4 mm	
7	201.0 mm	231.9 mm	255.0 mm	269.2 mm	
8	226.8 mm	257.7 mm	280.8 mm	295.0 mm	Area in gray are IO-Link models only. Not available in AC.
9	252.6 mm	283.5 mm	306.6 mm	320.8 mm	
10	278.4 mm	309.3 mm	332.4 mm	346.6 mm	

Accessories are listed on pages 61

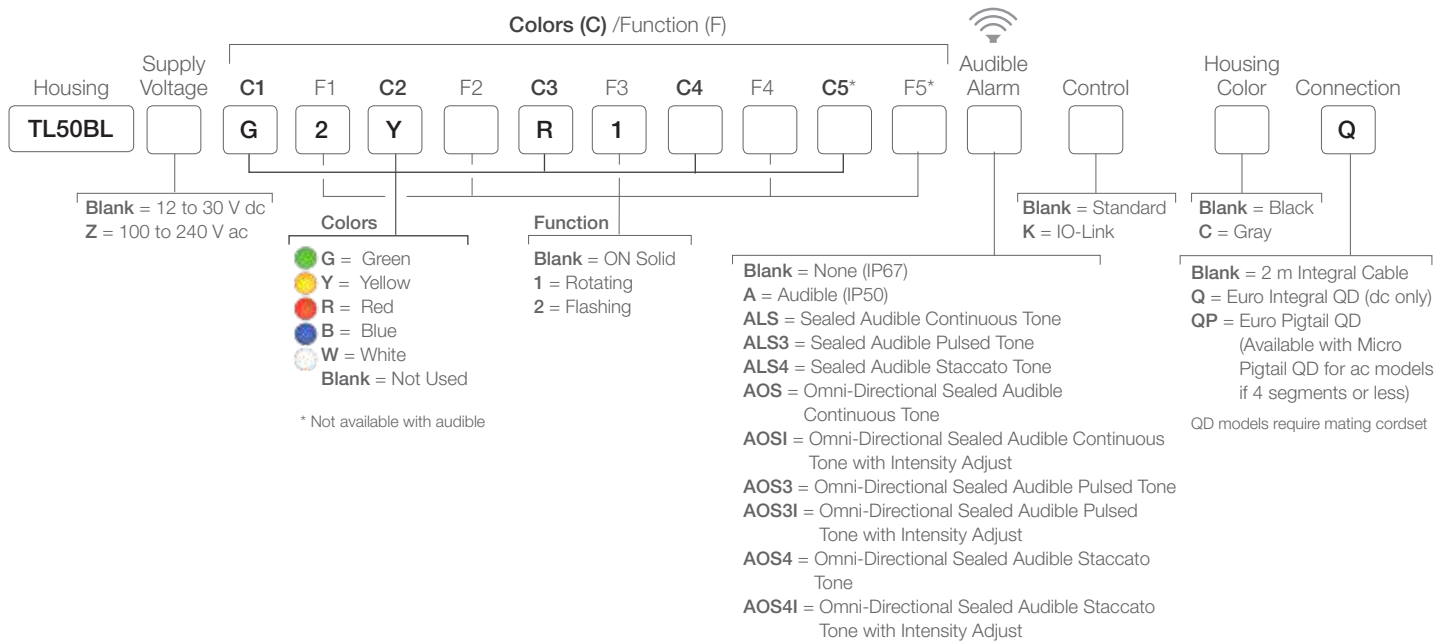


## TL50BL Beacon Tower Lights

---

- Housing is UV stabilized, making it suitable for use in outdoor environments
- Highly visible indication for indoor or outdoor applications
- Compact, stylish design with rotating and flashing options
- Audible alert: continuous, pulsed and staccato models available
- Omni-Directional audible models provide clear annunciation in the noisiest environments
- Models available with rugged, water-resistant IP67 housing

 **IO-Link**<sup>®</sup>



<b>Supply Voltage</b>	12 to 30 V dc or 21-27 V ac 100 to 240 V ac		
<b>Construction</b>	Bases and Covers: ABS Light Segment: Polycarbonate		
<b>Environmental Rating</b>	General-Purpose and Sealed Audible: IEC IP67 Standard Audible: IEC IP50		
<b>Operating Temperature</b>	General-Purpose: -40° to +50° C (-40° to +122° F) Standard and Sealed Audible: -20° to +50° C (-4° to +122° F)		
<b>Certifications</b>			

**Audible**  
max. intensity 92 db @ 1 meter (typical)

**Sealed Audible**  
max. intensity 94 db @ 1 meter (typical)

**Sealed Omni-Directional Audible**  
Standard: max. intensity 99 db @ 1 meter (typical)  
Intensity Adjust: max. intensity 95 db @ 1 meter (typical)



Color Count	Tower Height (H)				100 to 240 V AC
	General-Purpose IP67	Audible <sup>†</sup> IP50	Sealed Audible IP67	Sealed Omni-Directional	
1	46.2 mm	77.1 mm	100.2 mm	114.2 mm	
2	72.0 mm	102.9 mm	126.0 mm	140.0 mm	Add 69 mm to any of these heights to get total height
3	97.8 mm	128.7 mm	151.8 mm	165.8 mm	
4	123.6 mm	154.5 mm	177.6 mm	191.6 mm	
5	149.4 mm	—	—	—	

<sup>†</sup> Tower Height (H) with top unscrewed approximately 3.5 mm to allow sound to escape

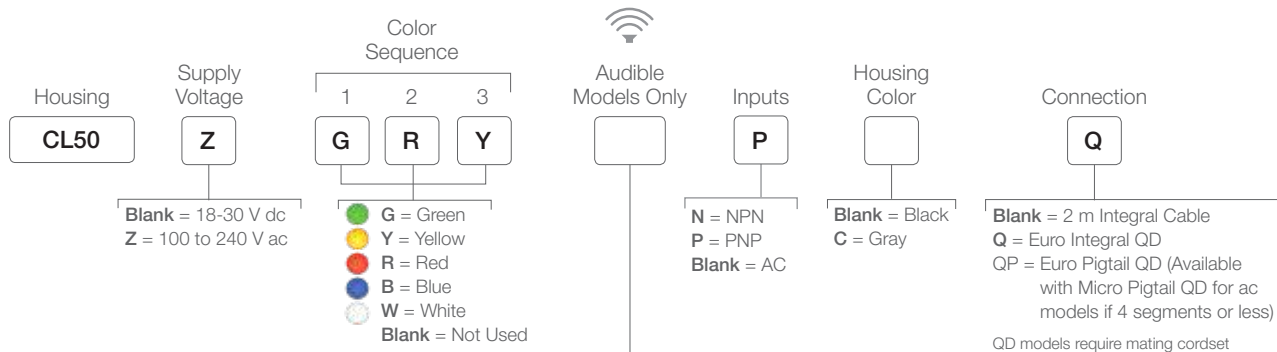
Accessories are listed on pages 61



## CL50 Column Lights

---

- Rugged, cost-effective, and easy-to-install multicolor indicators
- Illumination provides easy-to-see operator guidance and equipment status indication at long distances
- One-, two-, or three-color models available
- The LED light sources provide long life with low power consumption
- 100 to 240 V ac operation or 18 to 30 V dc operation
- Compact devices are completely self-contained—no controller needed—and IEC IP67 rated
- Immune to EMI and RFI interference
- No assembly required



- Blank = None (IP67)
- A = Audible (IP50)
- ALS = Sealed Audible Continuous Tone
- ALS3 = Sealed Audible Pulsed Tone
- ALS4 = Sealed Audible Staccato Tone
- AOS = Omni-Directional Sealed Audible Continuous Tone
- AOSI = Omni-Directional Sealed Audible Continuous Tone–Intensity Adjust
- AOS3 = Omni-Directional Sealed Audible Pulsed Tone
- AOS3I = Omni-Directional Sealed Audible Pulsed Tone–Intensity Adjust
- AOS4 = Omni-Directional Sealed Audible Staccato Tone
- AOS4I = Omni-Directional Sealed Audible Staccato Tone–Intensity Adjust

**Supply Voltage** | 12 to 30 V dc or 21 to 27 V ac  
100 to 240 V ac

**Construction** | Bases and Covers: ABS  
Light Segment: Polycarbonate

**Environmental Rating** | General-Purpose and Sealed Audible: IEC IP67  
Standard Audible: IEC IP50

**Operating Temperature** | General-Purpose:  
–40° to +50° C (–40° to +122° F)  
Standard and Sealed Audible:  
–20° to +50° C (–4° to +122° F)

**Certifications** |  



**Audible**  
max. intensity 92 db @ 1 meter (typical)

**Sealed Audible**  
max. intensity 94 db @ 1 meter (typical)

**Sealed Omni-Directional Audible**  
Standard: max. intensity 99 db @ 1 meter (typical)  
Intensity Adjust: max. intensity 95 db @ 1 meter (typical)

Laser Marking Available



General-Purpose



Audible



Sealed Audible



Sealed Omni-Directional Audible



100 to 240 V ac

Accessories are listed on pages 61



## Cordsets for DC Models

### 4-Pin M12/Euro-Style

use with 3-color models

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-406RA)

### 5-Pin M12/Euro-Style

use with 4-color models

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

### 8-Pin M12/Euro-Style

use with 5+ -color models

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC2S-806RA)



**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')

**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')

**MQDC2S-806**  
2 m (6.5')  
**MQDC2S-815**  
5 m (15')  
**MQDC2S-830**  
9 m (30')

## Mounting Brackets



SMB30MM



SMB30A



SMBAMS30P



SMB30RAVK

## Cordsets for AC Models

### 4-Pin Micro-Style

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQAC2-406RA)

### 5-Pin Micro-Style

Straight connector models



**MQAC2-406**  
2 m (6.5')  
**MQAC2-415**  
5 m (15')  
**MQAC2-430**  
9 m (30')

**MQAC2-506**  
2 m (6.5')  
**MQAC2-515**  
5 m (15')  
**MQAC2-530**  
9 m (30')

## Sealed Right-Angle Brackets



LMBE12RA



LMB30RA



LMBE12RAC



LMB30RAC



## Controller

**LC80T**  
5 Toggle switches  
ON-OFF-FLASH function

**LC80R**  
12-Position rotary  
switches ON-OFF-FLASH  
function

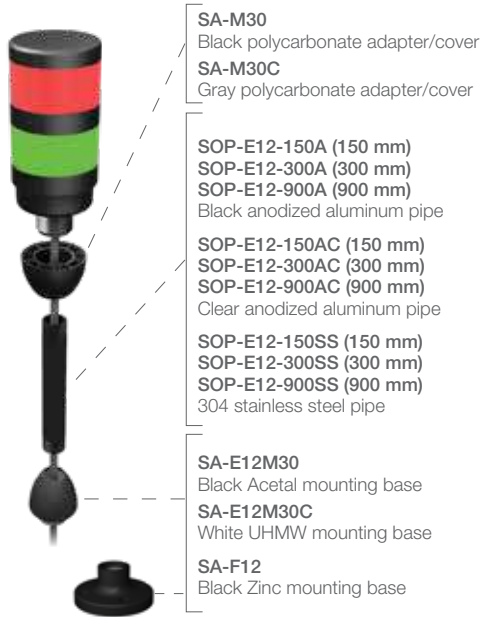


## Laser Marking

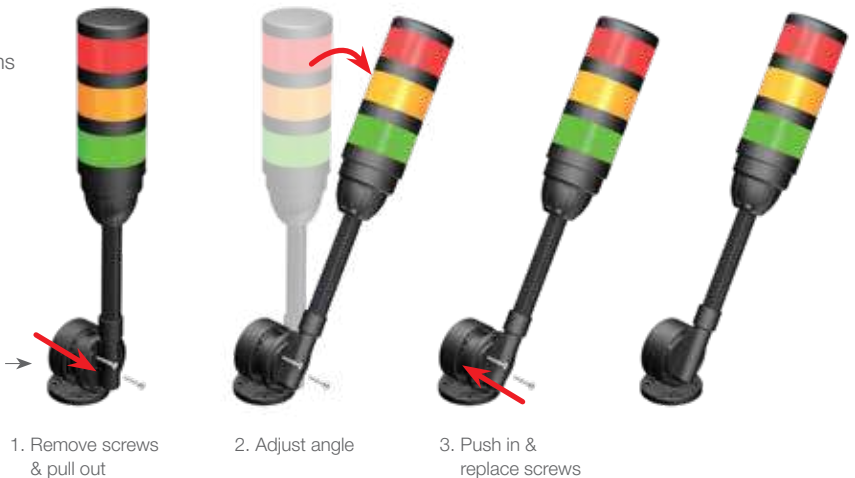
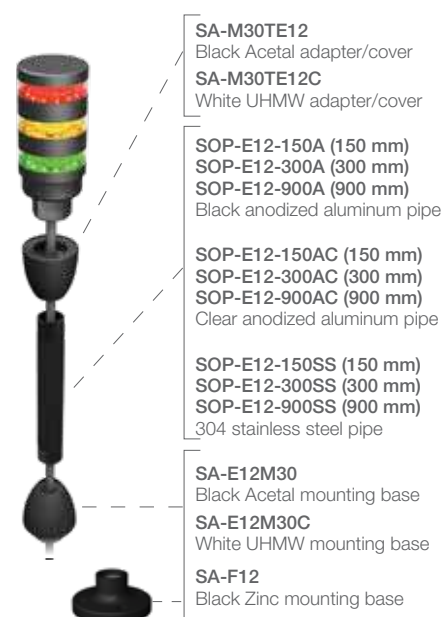
Light sections can be permanently marked with custom text or images

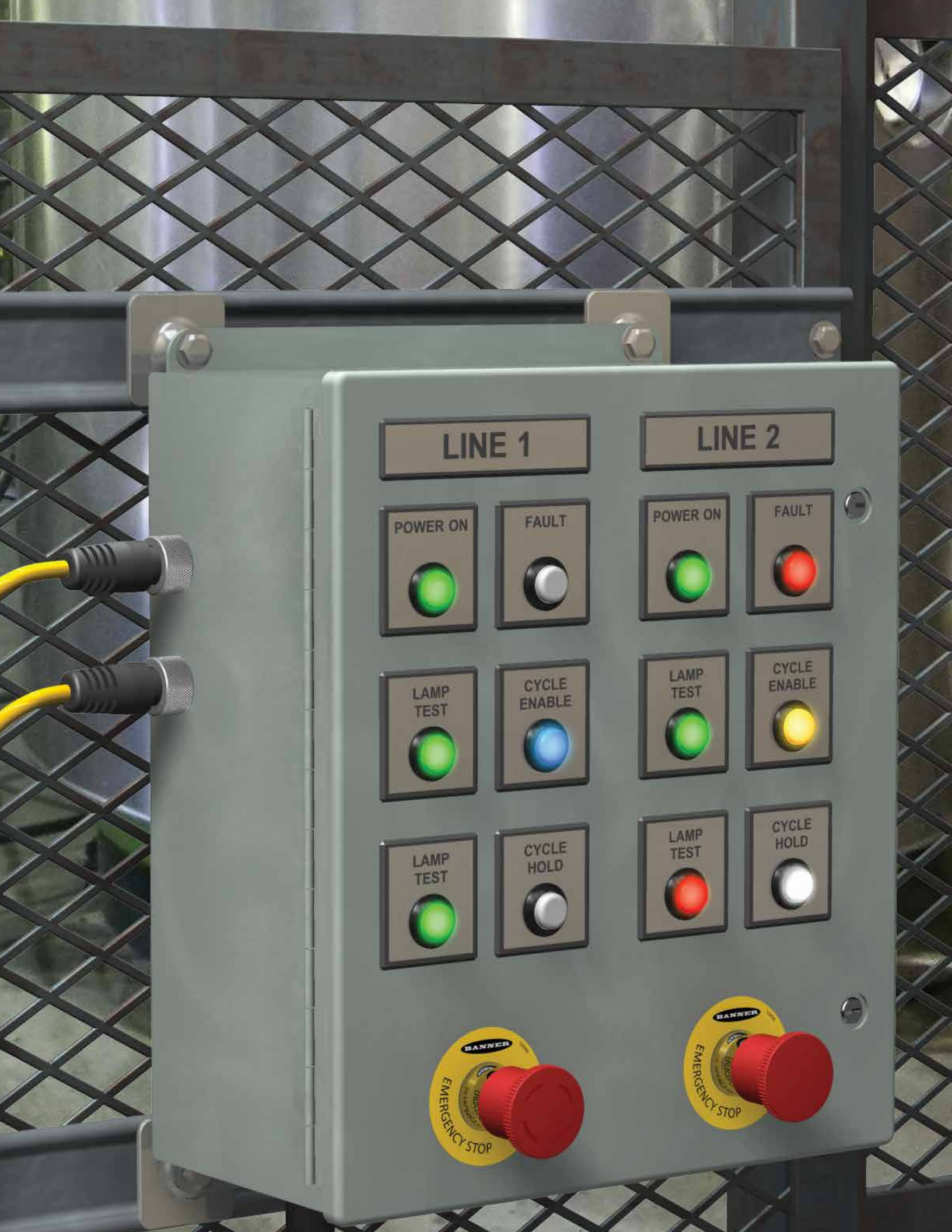
# Accessories

Elevated Mount System  
(for TL70)



Elevated Mount System  
(for other models)





LINE 1

LINE 2

POWER ON

FAULT

POWER ON

FAULT



LAMP TEST

CYCLE ENABLE

LAMP TEST

CYCLE ENABLE



LAMP TEST

CYCLE HOLD

LAMP TEST

CYCLE HOLD





# Indicators

Banner's Indicators offer a wide variety of bright, highly visible models ranging from daylight visible to multiple colors in one device. Indicators have a rugged design for long-term use and require no additional protective box. Flexibility in design, size and mounting provides a unique solution for many indication applications.

# Selection Guide



Base Mount

Page	66	68	72	74	78
Family Name	K30L2 K50L2	K30L K50L	K70L	K90L	K50BL
Dome Size (mm)	30 50	30 50	70	90	50
Mounting Hole Diameter (mm)	22 30	22 30	30	30	30
AC/DC Power Option	DC	AC or DC	DC	DC	AC or DC
Audible Alarm Options					
Daylight Visible Options					
Multiple Colors per Light Segment	1-7 colors 7+ with IO-Link	K30: 1-3 K50: 1-5	1-5	1-5	1-3 depending on model
IP67 Options	IP66, IP67, IP69K	IP67, IP69K		IP67	IP67, IP69K
IO-Link					
Flashing or Strobing Options					
Hazardous Area Models		page 82			
Modbus Models		page 80			page 80





Flat Mount

Barrel Mount

92	88	90	94	84	86
K80 Segmented	K50FL	K80	SP Series	S18L/S22L	S22L2 Flush
80	50	50	50	18	20
NA	NA	NA	NA	18/22	22
DC	DC	AC or DC	AC or DC	DC	DC
	1-5	1-5	1-3	1-3	1-7
IP67	IP67, IP69K	IP67	IP67	IP67, IP69K	IP66, IP67, IP69K

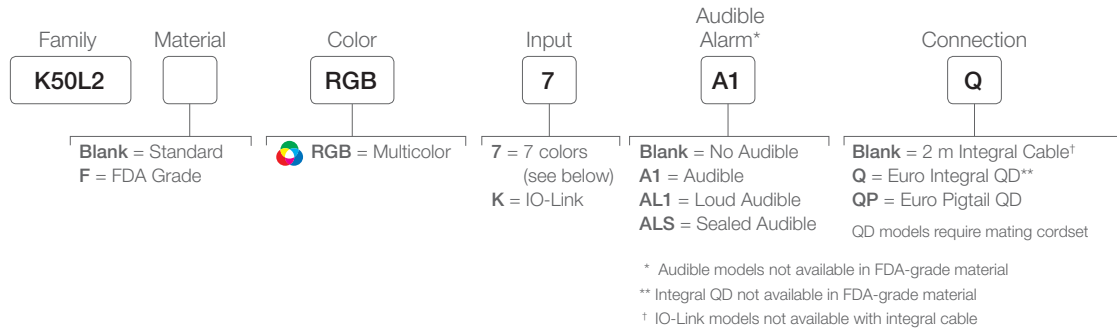


## K50L2 and K30L2 Domed Indicators

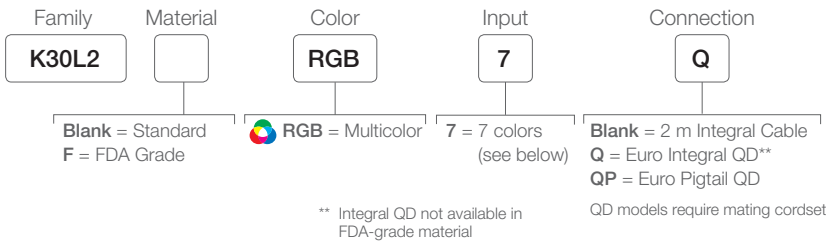
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- Bright, even indication in red, green, blue, yellow, cyan, magenta, and white
- Rugged IP66, IP67, and IP69K polycarbonate housing protects against impact and withstands high-pressure, high-temperature washdown to ensure reliable performance in challenging environments
- Models constructed from FDA-grade materials available for use in food and beverage applications
- Simple wiring plan enables quick installation and allows users to consolidate controller outputs
- An optional audible alarm provides a distinct, loud notification of status (K50L2 models only)
- IO-Link enables full control of color, flashing, dimming, and advanced animations like rotation, strobing, 2-color display, 2-color rotation, 2-color flashing, and chase

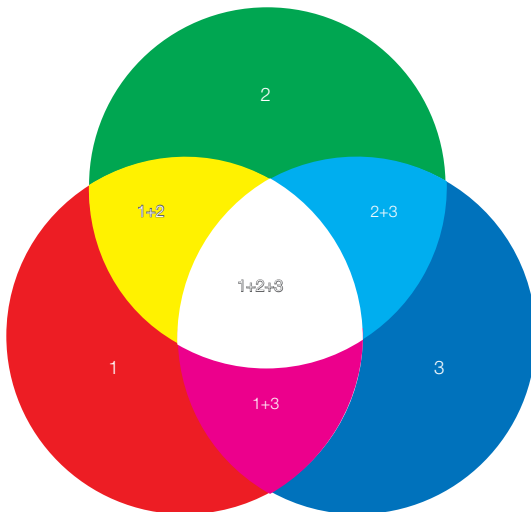
## K50L2



## K30L2



Seven colors now available in one unit



	Input 1	Input 2	Input 3
Red	ON		
Green		ON	
Blue			ON
Yellow	ON	ON	
Cyan		ON	ON
Magenta	ON		ON
White	ON	ON	ON

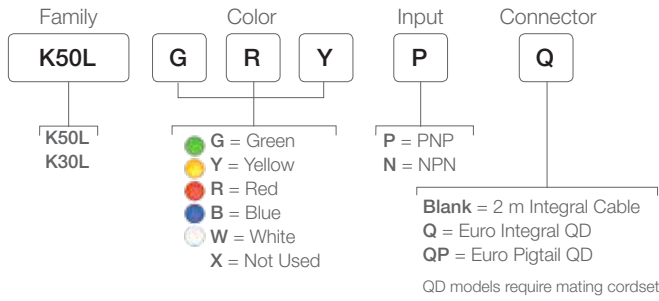


## K50L and K30L Domed Indicators

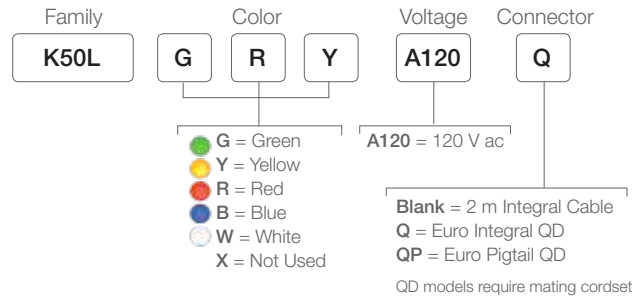
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- Rugged, cost-effective and easy-to-install indicators
- Illuminated dome provides easy-to-see operator guidance and indication of equipment status
- Compact devices are completely self-contained — no controller needed
- Displays up to five colors
- Immune to EMI and RFI interference

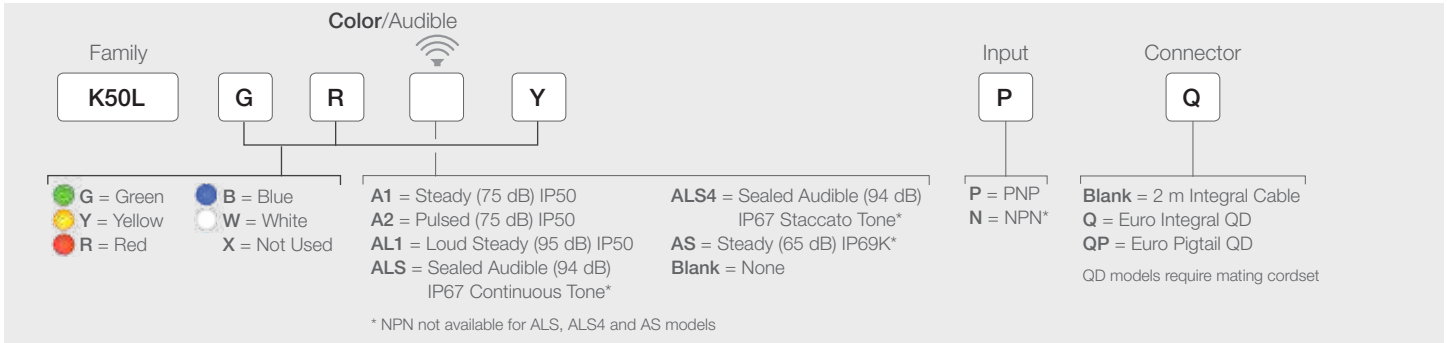
### One-, Two- or Three-Color Indicators 18 to 30 V dc



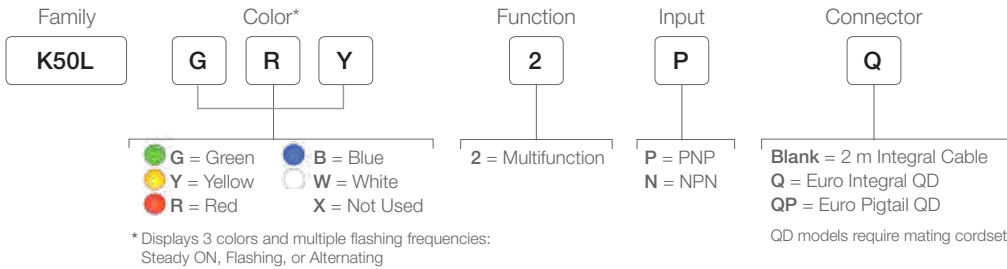
### One-, Two- or Three-Color Indicators 85 to 120 V ac



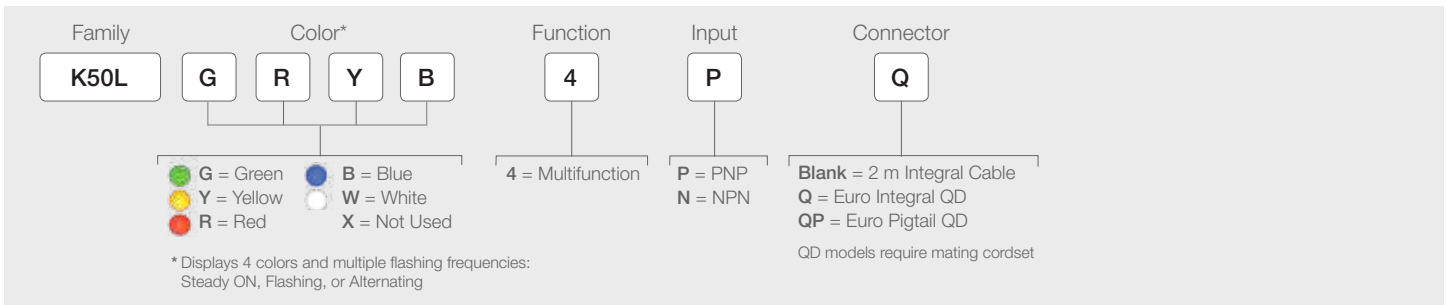
### One-, Two- or Three-Color Audible Indicators



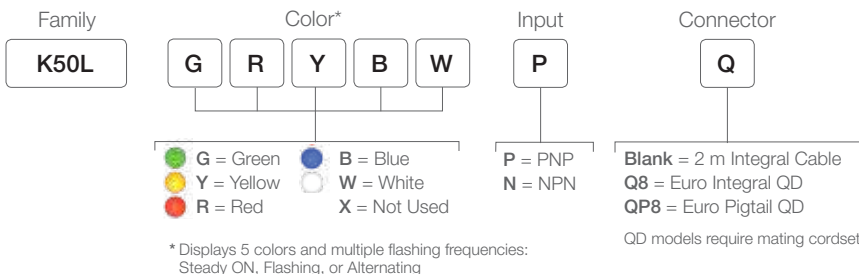
### Three-Color Multifunction Indicators



### Four-Color Multifunction Indicators







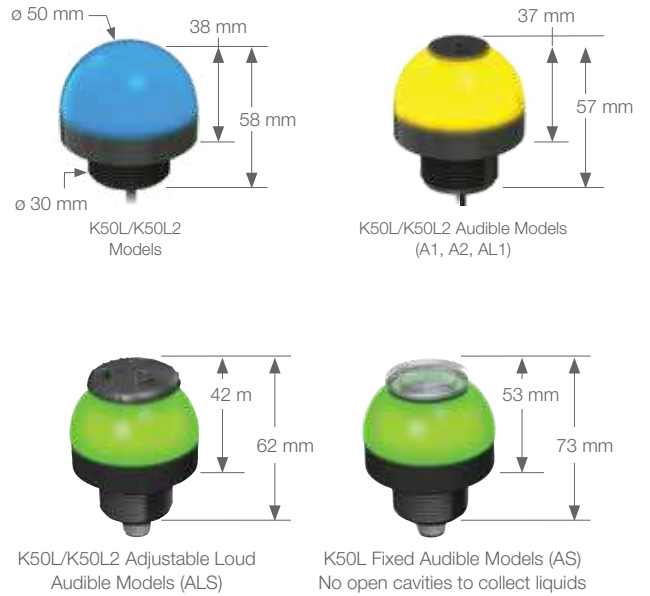
### Five-Color Multifunction Indicators







### K50L/K30L Specifications

<b>Supply Voltage</b>	K50L Sealed Audible: 12 to 30 V dc K50L AC: 85 to 130 V ac K50L standard: 18 to 30 V dc K30L: 10 to 30 V dc
<b>Construction</b>	Base: polycarbonate Translucent Dome: polycarbonate
<b>Environmental Rating</b>	Standard Models: IEC IP67 Integral QD models meet DIN 40050 (IP69K)  Standard Audible Models (A1, A2, AL1): IP50  Fixed Audible Sealed Models (AS): IEC IP67/ IP69K per DIN 40050  Adjustable Loud Audible Sealed Models (ALS, ALS4): IEC IP67/ IP69K per DIN 40050
<b>Operating Temperature</b>	Sealed Audible: -20 to +50 °C (-4 to +122 °F) All Other Models: -40 to +50 °C (-40 to +122 °F)
<b>Certifications</b>	  Audible:  



### K50L2/K30L2 Specifications

<b>Power</b>	K50L2: 10 to 30 V dc; 220mA Max. at 10 V dc; 100mA Max. at 30 V dc K30L2: 10 to 30 V dc; 60mA Max. at 10 V dc; 30mA Max. at 30 V dc
<b>Operating Conditions</b>	-40 to +50 °C (-40 to +122 °F)
<b>Construction</b>	Base: polycarbonate Translucent Dome: polycarbonate
<b>Environmental Rating</b>	K50L2: Standard: IEC IP66/IP67/IP69K Standard Audible: IEC IP50 Sealed Audible: IEC IP66/IP67/IP69K  K30L2: IEC IP66/IP67/IP69K
<b>Certifications</b>	 



# Accessories



SMB30A



SMB30SC



SMB30FA



SMB30FVK



SMB22A



SMBAMS22P



SMBAMS22RA



**SA-FFB12**  
Black flush foldable  
bracket for use with  
elevated mount systems



**SA-FFB12C**  
Gray flush foldable  
bracket for use with  
elevated mount systems

see page 61 for additional information on this bracket

## Cordsets for DC Models



### 4-Pin M12/Euro-Style

use with 3-color models  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-406RA)

- MQDC-406**  
2 m (6.5')
- MQDC-415**  
5 m (15')
- MQDC-430**  
9 m (30')

### 5-Pin M12/Euro-Style

use with 4-color models  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

- MQDC1-506**  
2 m (6.5')
- MQDC1-515**  
5 m (15')
- MQDC1-530**  
9 m (30')

### 8-Pin M12/Euro-Style

use with 5+ -color models  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC2S-806RA)

- MQDC2S-806**  
2 m (6.5')
- MQDC2S-815**  
5 m (15')
- MQDC2S-830**  
9 m (30')

## Cordsets for AC Models



### 4-Pin Micro-Style

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQAC2-406RA)

- MQAC2-406**  
2 m (6.5')
- MQAC2-415**  
5 m (15')
- MQAC2-430**  
9 m (30')

### 5-Pin Micro-Style

Straight connector models

- MQAC2-506**  
2 m (6.5')
- MQAC2-515**  
5 m (15')
- MQAC2-530**  
9 m (30')

## Elevated Mount System



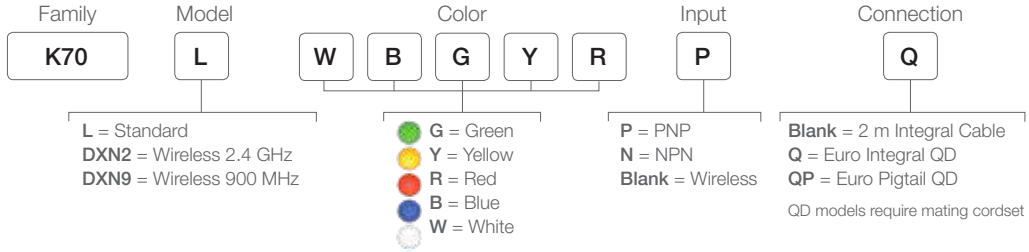





## K70L 70 mm Domed Indicators

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- Bright, uniform indicator light
- All models have flashing input control
- Models are available with up to five colors in one device
- Rugged IP65-rated design
- 12 V to 30 V dc operation
- Wireless models simplify installation and provide a simple operator interface for pick-to-light, call button and general industrial applications

## Standard and Wireless



Supply Voltage and Current	12 V to 30 V dc; 200 mA Max. at 12 V dc; 90 mA Max. at 30 V dc
Supply Protection Circuitry	Protected against reverse polarity, transient voltages
Construction	Base: polycarbonate Translucent Dome: polycarbonate
Environmental Rating	IEC IP65
Operating Temperature	-40 to 50 °C
Certifications	  



## Elevated Mount System

 <b>SMB30A</b>	 <b>SMB30MM</b>	 <b>SA-M30</b> Black polycarbonate adapter/cover <b>SA-M30C</b> Gray polycarbonate adapter/cover	
 <b>SMBAMS30P</b>	 <b>SSA-MBK-EEC1</b>	<b>SOP-E12-150A (150 mm)</b> <b>SOP-E12-300A (300 mm)</b> <b>SOP-E12-900A (900 mm)</b> Black anodized aluminum pipe <b>SOP-E12-150AC (150 mm)</b> <b>SOP-E12-300AC (300 mm)</b> <b>SOP-E12-900AC (900 mm)</b> Clear anodized aluminum pipe <b>SOP-E12-150SS (150 mm)</b> <b>SOP-E12-300SS (300 mm)</b> <b>SOP-E12-900SS (900 mm)</b> 304 stainless steel pipe	<b>5-Pin M12/Euro-Style</b> use with 4-color models Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)
		<b>SA-E12M30</b> Black Acetal mounting base <b>SA-E12M30C</b> White UHMW mounting base	<b>8-Pin M12/Euro-Style</b> use with 5+ -color models Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC2S-806RA)
		<b>SA-FFB12</b> Black flush foldable bracket for use with elevated mount systems <b>SA-FFB12C</b> Gray flush foldable bracket for use with elevated mount systems	<b>MQDC1-506</b> 2 m (6.5') <b>MQDC1-515</b> 5 m (15') <b>MQDC1-530</b> 9 m (30')
			<b>MQDC2S-806</b> 2 m (6.5') <b>MQDC2S-815</b> 5 m (15') <b>MQDC2S-830</b> 9 m (30')

See page 61 for additional information on this bracket

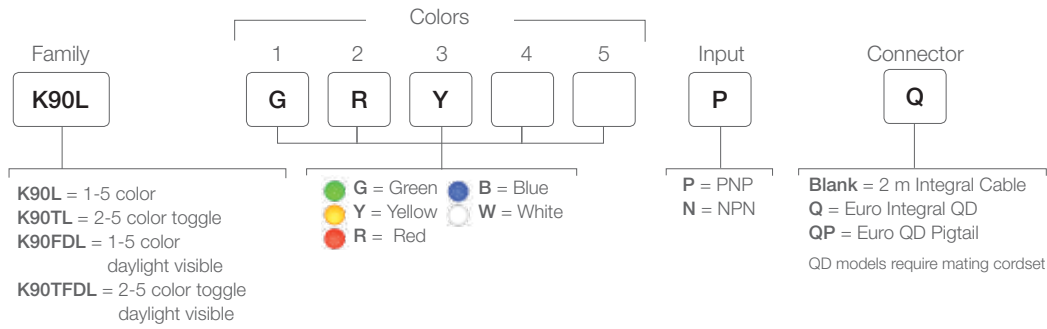




## K90L 90 mm Domed Indicators

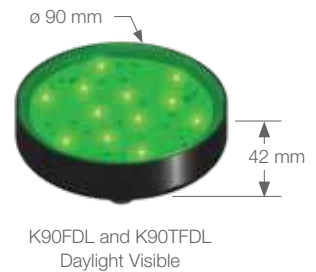
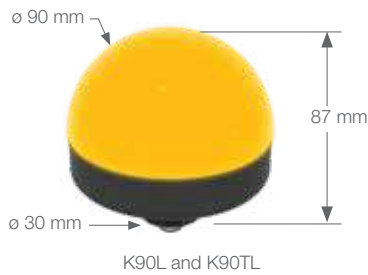
---

- Bright, uniform indicator light
- Models are available with up to five colors in one device
- Rugged IP67-rated design
- 12 to 30 V dc operation
- Illuminated dome provides easy-to-see operator guidance
- K90TL models alternate between colors when multiple inputs are active
- K90L models have an auxiliary input line for flashing an active input

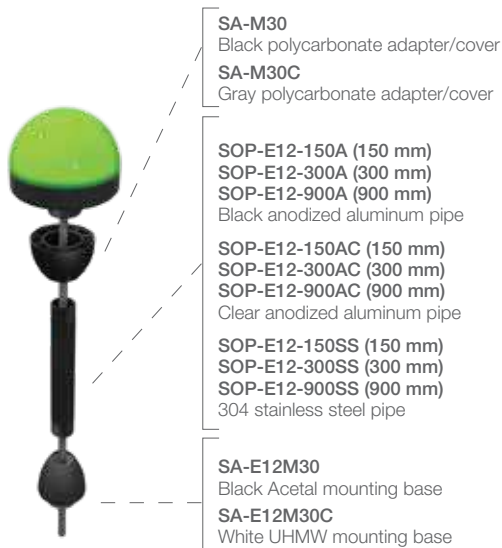




Supply Voltage	12 to 30 V dc
Construction	Base: polycarbonate Translucent Dome: polycarbonate
Environmental Rating	IP67
Operating Temperature	-40 to +50° C (-40 to +122 °F)
Certifications	 



## Elevated Mount System



**5-Pin M12/Euro-Style**  
use with 4-color models

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')

**8-Pin M12/Euro-Style**  
use with 5+ -color models

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC2S-806RA)

**MQDC2S-806**  
2 m (6.5')  
**MQDC2S-815**  
5 m (15')  
**MQDC2S-830**  
9 m (30')

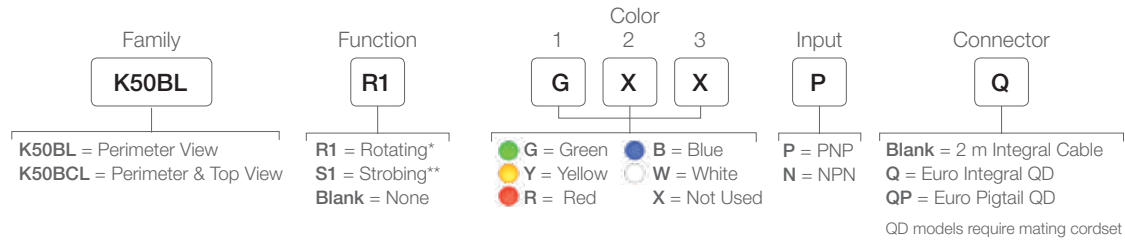


## K50 Beacon Omni-Directional High-Intensity Indicators

---

- Continuous, strobing and rotating models available
- Intense levels of light output for outdoor applications
- 12-30 V dc models are ideal for battery-powered mobile applications
- LED lighting emits from the perimeter and top view on some models
- Rugged, sealed thermoplastic housing rated for IP67 and IP69K
- Cabled and quick-disconnect models available

## One-, Two-, or Three-Color DC



\* Rotating only available on K50BL 1-color models  
\*\* Strobing only available on K50BCL 1-color models

## One- Color AC



### Supply Voltage

12 to 30 V dc  
85 to 130 V ac  
100 to 250 V ac

### Construction

Base and covers: polycarbonate

### Environmental Rating

IEC IP67 and IP69K, per DIN 40050

### Operating Temperature

-40 to +50 °C (-40 to +122 °F)

### Certifications



- SA-M30E12**  
Black Acetal adapter/cover
- SA-M30E12C**  
White UHMW adapter/cover
- SOP-E12-150A (150 mm)**  
**SOP-E12-300A (300 mm)**  
**SOP-E12-900A (900 mm)**  
Black anodized aluminum pipe
- SOP-E12-150SS (150 mm)**  
**SOP-E12-300SS (300 mm)**  
**SOP-E12-900SS (900 mm)**  
304 stainless steel pipe
- SA-E12M30**  
Black Acetal mounting base
- SA-E12M30C**  
White UHMW mounting base



**4-Pin M12/ Euro-Style**  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')

**3-Pin M12/Micro-Style**  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-306RA)

**MQDC-306**  
2 m (6.5')  
**MQDC-315**  
5 m (15')  
**MQDC-330**  
9 m (30')



see page 61 for additional information on this folding bracket

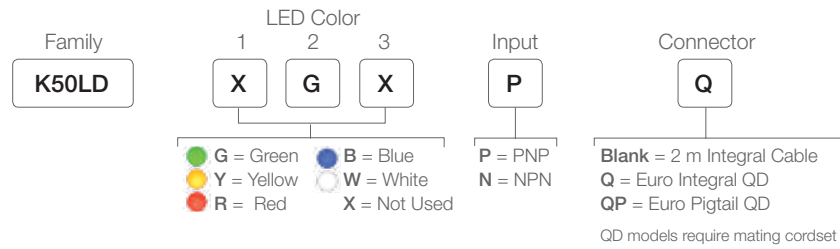


## K50L Daylight Visible Directional Indicators

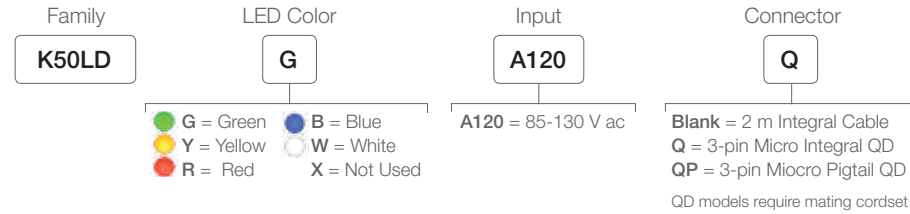
---

- Intense levels of light output for outdoor applications
- Rugged, cost-effective and easy-to-install
- Compact devices are completely self-contained — no controller needed
- Up to three colors in one housing
- Immune to ambient light, EMI and RFI interference
- 50 mm diameter with flat profile and 30 mm mounting base
- Available in both 18 to 30 V dc and 85 to 130 V ac power options

## One- or Three- Color Indicators, 15 to 30 V dc



## One- Color Indicators, 85 to 130 V ac



Supply Voltage	15 to 30 V dc 85 to 130 V ac
Construction	Polycarbonate; fully encapsulated
Environmental Rating	IEC IP67
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Certifications	<b>CE</b>



**4-Pin M12/ Euro-Style**  
 Straight connector models listed;  
 for right-angle models, add RA to  
 the end of model number  
 (example, MQDC-406RA)

**MQDC-406**  
 2 m (6.5')  
**MQDC-415**  
 5 m (15')  
**MQDC-430**  
 9 m (30')

**3-Pin M12/Micro-Style**  
 Straight connector models listed;  
 for right-angle models, add RA to  
 the end of model number  
 (example, MQDC-306RA)

**MQDC-306**  
 2 m (6.5')  
**MQDC-315**  
 5 m (15')  
**MQDC-330**  
 9 m (30')

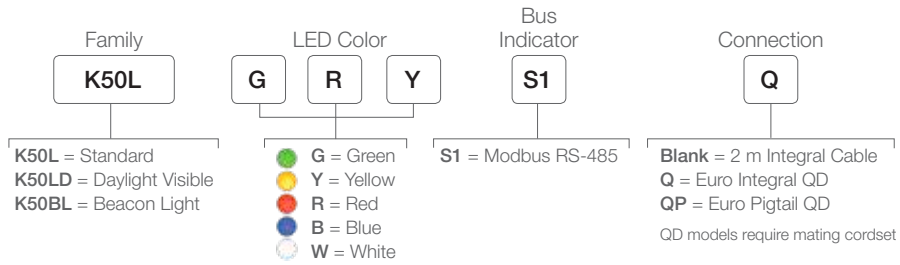






## K50 Modbus Indicators

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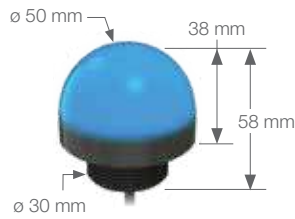
- Rugged, compact multi-color indicators in several package types
- Built-in flashing and strobing capability
- High intensity models for outdoor applications
- Fully encapsulated IP67/IP69K construction
- Modbus RTU communication minimizes the cabling requirements



Supply Voltage	12 to 30 V dc
Construction	Base: Polycarbonate Covers: Polycarbonate LEDs on LD Models: Acrylic
Environmental Rating	IEC IP67/IP69K per DIN 40050
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Certifications	 



K50BL Models



K50L Models



K50LD Models



SMB30A



SMB30FA



SMB30SC



SMBAMS30P



- SA-M30E12  
Black Acetal adapter/cover
- SA-M30E12C  
White UHMW adapter/cover
- SOP-E12-150A (150 mm)  
SOP-E12-300A (300 mm)  
SOP-E12-900A (900 mm)  
Black anodized aluminum pipe
- SOP-E12-150SS (150 mm)  
SOP-E12-300SS (300 mm)  
SOP-E12-900SS (900 mm)  
304 stainless steel pipe
- SA-E12M30  
Black Acetal mounting base
- SA-E12M30C  
White UHMW mounting base



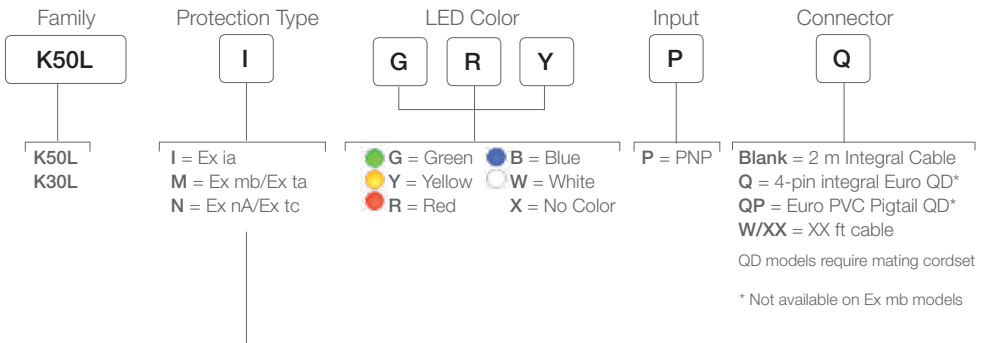
see page 61 for additional information on this folding bracket



## K50 and K30 Hazardous Indicators

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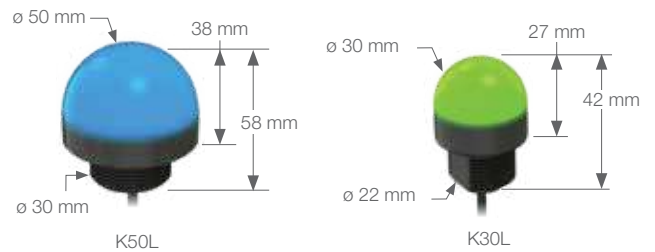
- Up to three colors in one device and five colors to choose from
- Models rated to IP67 and IP69K for use in harsh environments
- Unique design appears gray when off, eliminating false indication from ambient light
- Easy mounting and configuration
- Extensive approvals ensure indicator lights are safe to use in most classified zones or areas.
- Worldwide IECEx approval for quicker access into countries outside Europe and North America



Indicator Family	Protection Method	Suitable for ATEX	Suitable for NEC & CEC	
Ex ia	Intrinsically Safe	Gas Zones: 0, 1, & 2 Dust Zones: 20, 21, & 22 Mines	Gas zones: 0, 1, & 2	Class I Division 1 & 2 Class II/III Division 1 & 2
Ex mb/Ex ta	Encapsulation/Enclosure	Gas Zones: 1 & 2 Dust Zones: 20, 21 & 22	Gas zones: 1 & 2	Class I Division 2 Class II/III Division 1 & 2**
Ex nA/Ex tc	Non-Sparking/Enclosure	Gas Zones: 2 Dust Zones: 22	Gas zones: 2	Class I Division 2 Class II/III Division 2**

\*\* Available on K50L models only

- Supply Voltage**  
Ex ia: 8 to 30 V dc  
Ex mb/Ex ta and Ex nA/Ex tc: 10 to 30 V dc
- Construction**  
Base: polycarbonate  
Translucent Dome: polycarbonate
- Environmental Rating**  
IP67, IP69K
- Operating Temperature**  
-40 to +50 °C (-40 to +122 °F)
- Certifications**  

**4-Pin M12/Euro-Style**  
 Straight connector models listed;  
 for right-angle models, add RA  
 to the end of model number  
 (example, MQDC-406RA)

- MQDC-406**  
2 m (6.5')
- MQDC-415**  
5 m (15')
- MQDC-430**  
9 m (30')



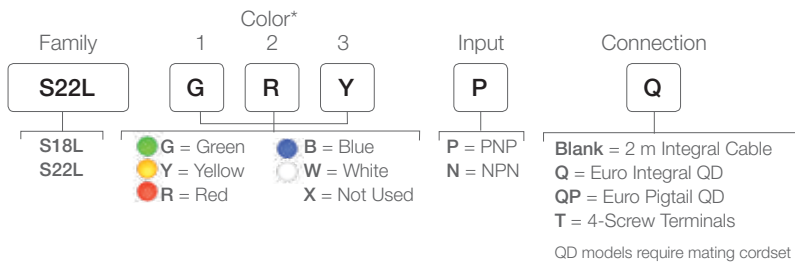
## S18L & S22L Barrel Indicators

---

- Gasketed face flange for sealing to enclosures
- IP69K rated to withstand harsh wash-down environments
- Daylight visible models are also available for areas with high levels of ambient light
- M12 Euro connector models available for plug-and-play indication
- 10 to 30 V dc operating range allows for use in battery-powered mobile applications
- Terminal-wired models available to simplify panel wiring
- Up to three independent colors in one unit
- Translucent face appears gray when off to avoid false indication
- Multiple colors available, including green, red, yellow, blue, white, orange
- Available with PNP or NPN input, depending on model

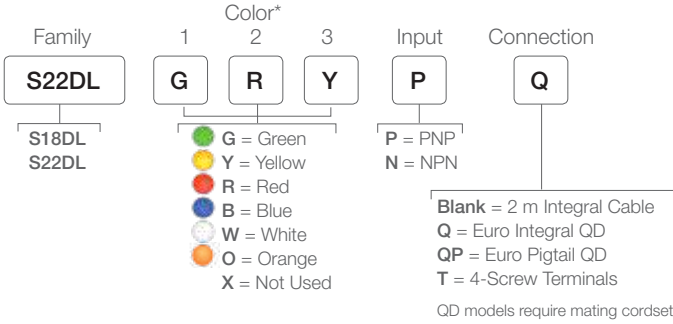


## Standard

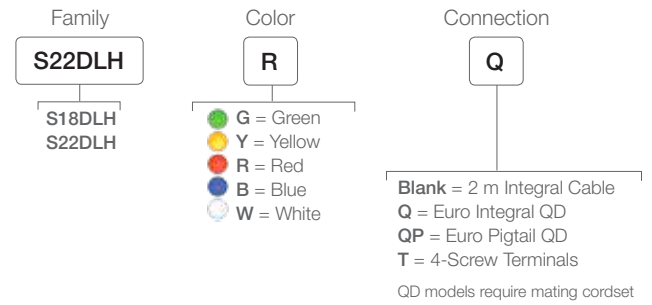


Laser Marking Available

## Daylight Visible



## Daylight Visible High-Intensity



\* Single-color models are available and should be ordered as PNP, but can be wired for either PNP or NPN input

### Supply Voltage

General Purpose: 10 to 30 V dc  
 High-Intensity Models: 9 to 30 V dc

### Construction

Housing: UV stabilized polycarbonate  
 Mounting Nut: PBT  
 Sealing Washer: Nitrile

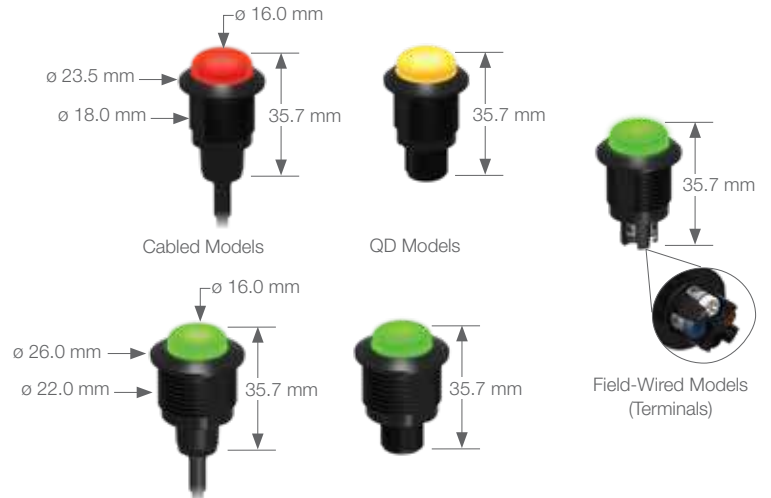
### Environmental Rating

IEC IP67, IP69K, per DIN 40050

### Operating Temperature

General Purpose: -40 to +50 °C (-40 to +122 °F)  
 Other Models: -40 to +60 °C (-40 to +140 °F)

### Certifications



**SMB18A**  
use with S18L



**SMB18FA**  
use with S18L



**SMB22A**  
use with S22L



**SMBAMS18RA**  
use with S18L



**SMBC18**  
for use with S18L  
on 28 mm pipe



**SMBAMS22RA**  
use with S22L



**4-Pin M12/Euro-Style**  
 Straight connector models listed;  
 for right-angle models, add RA  
 to the end of model number  
 (example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')



## S22L2 Flush Mount Indicator

---

- Bright, even indication in red, green, blue, yellow, cyan, magenta, and white
- Models constructed from FDA-grade materials available for use in food and beverage applications
- Terminal connector options for fast, economical installation in panels
- Flush design matches S22 Touch buttons, see page 102



**Supply Voltage**

10 to 30 V dc

**Construction**

Housing: Polycarbonate or FDA grade plastic, depending on model  
 Translucent dome: Polycarbonate or FDA grade plastic, depending on model  
 Mounting Nut: PBT or FDA food grade plastic

**Environmental Rating**

Standard: UL Type 4x, 13  
 FDA Grade: UL Type 4x (indoor)  
 Cable, Pigtail, QD models: IEC IP66, IP67, IP69K per DIN 40050-9  
 Terminal models: IEC IP66, IP69K per DIN 40050-9 on front only

**Operating Conditions**

Temperature: -40 to +50 °C  
 Storage Temperature: -40 to +70 °C

**Certifications**



**5-Pin Euro-Style**  
 Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

**MQDC1-506**  
 2 m (6.5')  
**MQDC1-515**  
 5 m (15')  
**MQDC1-530**  
 9 m (30')

**5-pin M12 Euro-Style Washdown Cordset**  
 Straight connector models only

**MQDC-WDSS-0506**  
 2 m (6.5')  
**MQDC-WDSS-0515**  
 5 m (15')  
**MQDC-WDSS-0530**  
 9 m (30')

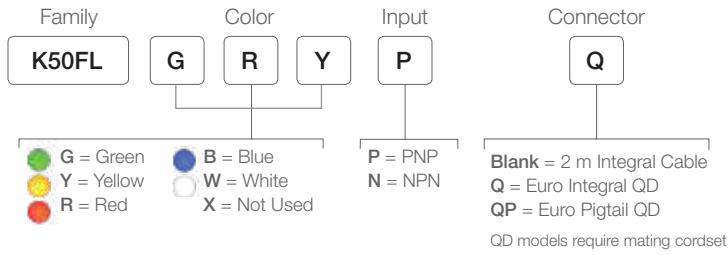


## K50FL Flat-Mount Domed Indicators

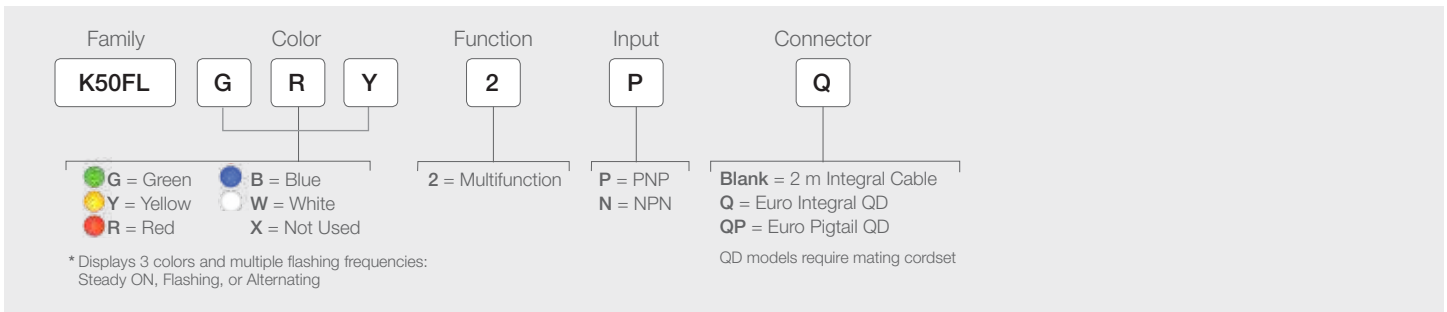
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- Rugged, cost-effective and easy-to-install indicators
- Low power consumption LED design will provide years of reliable service
- Fully encapsulated IP67, IP69K
- Illuminated dome provides easy-to-see operator guidance and indication of equipment status
- Compact devices are completely self-contained — no controller needed
- 18 to 30 V dc operation
- Displays up to five colors
- Immune to EMI and RFI interference

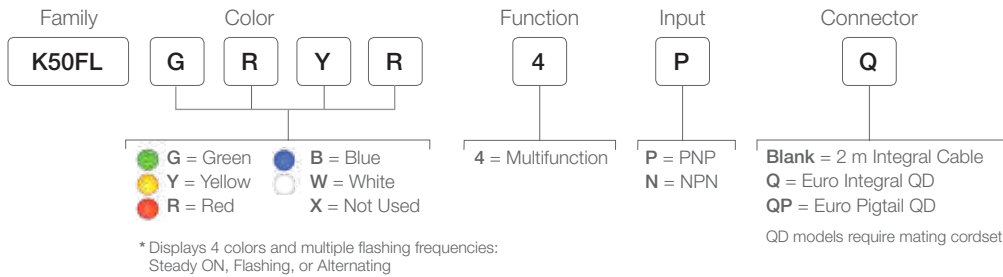
## One-, Two- or Three-Color, 18 to 30 V dc



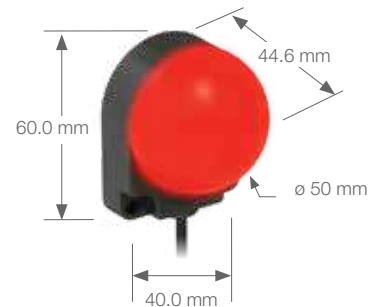
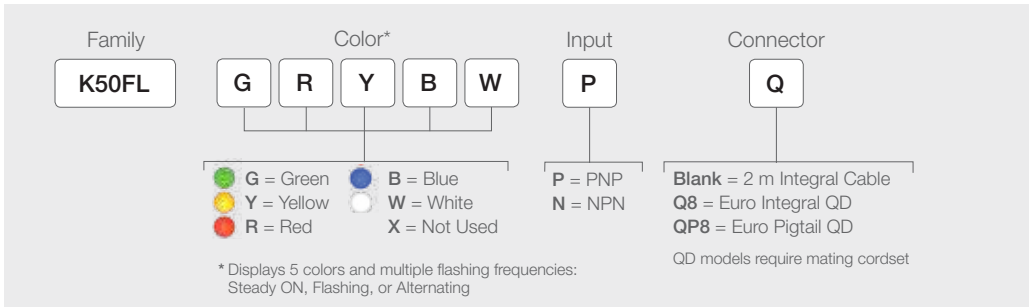
## Three-Color Multifunction



## Four-Color Multifunction



## Five-Color Multifunction



Supply Voltage	18 to 30 V dc
Construction	Base: ABS Dome: Polycarbonate
Environmental Rating	IP67, IP69K
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Certifications	<b>CE</b>



**4-Pin M12/Euro-Style**  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-406RA)

4-Pin	5-Pin	8-Pin
<b>MQDC-406</b> 2 m (6.5')	<b>MQDC1-506</b> 2 m (6.5')	<b>MQDC2-806</b> 2 m (6.5')
<b>MQDC-415</b> 5 m (15')	<b>MQDC1-515</b> 5 m (15')	<b>MQDC2-815</b> 5 m (15')
<b>MQDC-430</b> 9 m (30')	<b>MQDC1-530</b> 9 m (30')	<b>MQDC2-830</b> 9 m (30')

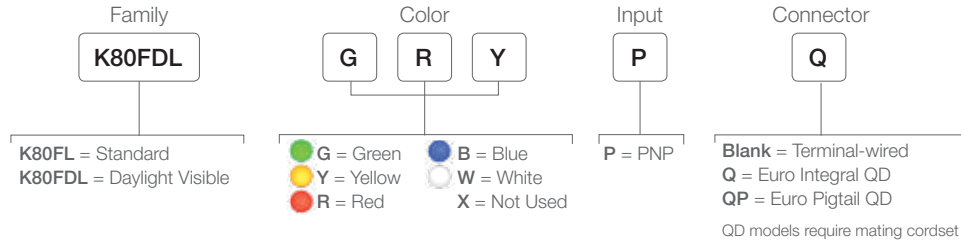




## K80FL and K80FDL Flat-Mount Indicators

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- Selection of solid or flashing light operation with internal DIP Switch
- Multicolor, single segment
- Bright, even LED light gray when OFF
- Unique shape for use in various indication applications
- Sealed to IP67 for durability in many environments
- Large, flat face allows for clear indication from greater distances
- Transparent self-adhesive cover labels can be printed for easy identification
- Daylight visible models available



Supply Voltage	12 to 30 V dc
Construction	Base: Polycarbonate Translucent Face: Acrylic
Environmental Rating	IEC IP67
Operating Conditions	-40 to +50 °C (-40 to +122 °F)
Certifications	<b>CE</b>



**SMBDX80DIN**  
for mounting to 35 mm DIN Rail



**4-Pin M12/Euro-Style**  
 Straight connector models listed;  
 for right-angle models, add RA  
 to the end of model number  
 (example, MQDC-406RA)

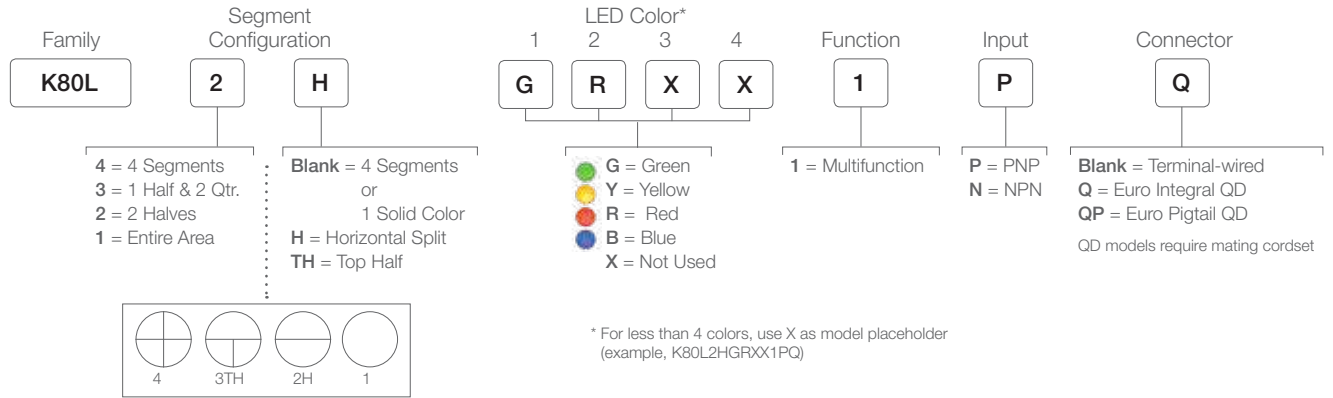
- MQDC-406**  
2 m (6.5')
- MQDC-415**  
5 m (15')
- MQDC-430**  
9 m (30')



## K80 Segmented Indicators

---

- Individual color quadrants can be lighted separately or in combination
- For error-proofing and "Andon" applications
- Provides operator guidance, even for those with limited color recognition ability
- Optional labels for enhanced segment identification
- Mounts easily on flat surface or pipe for elevated use
- PNP (sourcing) or NPN (sinking) input type, depending on model
- Flash functionality available on one-color models



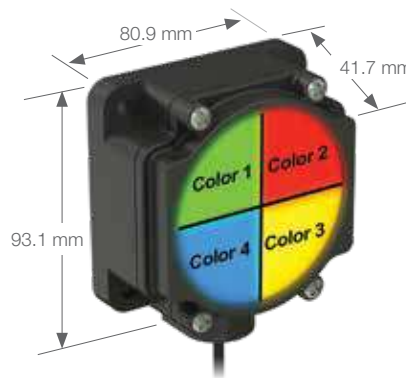
Supply Voltage: 18 to 30 V dc

Construction: Base: ABS/Polycarbonate  
Translucent Face: Acrylic

Environmental Rating: IEC IP67

Operating Temperature: -40 to +50 °C (-40 to +122 °F)

Certifications: **CE**



**SMBDX80DIN**  
for mounting to 35 mm DIN Rail

**Segmented Indicator Label Kits**



**SALK-K80L4**  
4-segment transparent laser label (includes 30 labels and 1 protective cover labels)



**SALK-K804-0**  
1-segment transparent laser label (includes 30 labels)



**5-Pin M12/  
Euro-Style**  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')

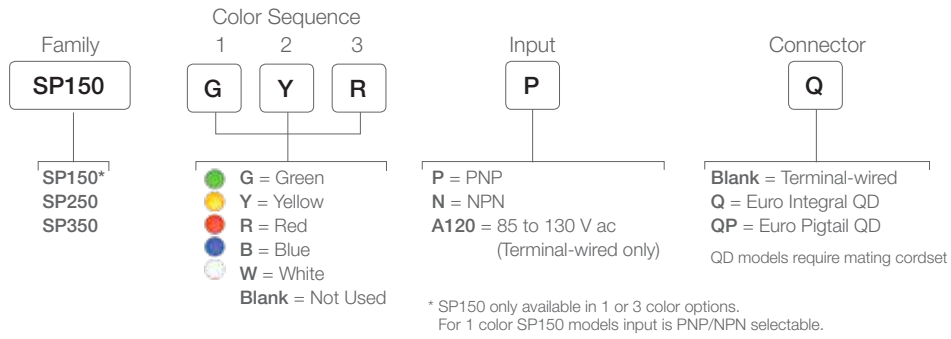


## SP Series Signal Lights

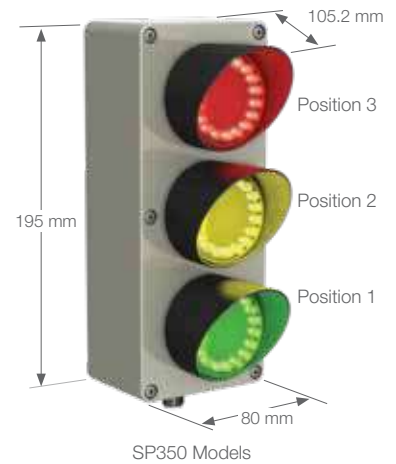
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- Intense levels of light output for outdoor applications
- Controlled field of view for signage and narrow lane use
- Rugged, cost-effective and easy-to-install
- Compact devices are completely self-contained — no controller needed
- Immune to EMI and RFI interference
- Choose NPN or PNP input, and 15 to 30 V dc or 85-130 V ac operation, depending on model





Supply Voltage	15 to 30 V dc 85 to 130 V ac
Construction	Flat or DIN-mount polycarbonate
Environmental Rating	SP150: IEC IP67 SP250: IEC IP65 SP350: IEC IP65
Operating Conditions	-40 to +50 °C (-40 to +122 °F)
Certifications	<b>CE</b>



**SMBDX80DIN**  
for mounting to 35 mm DIN Rail

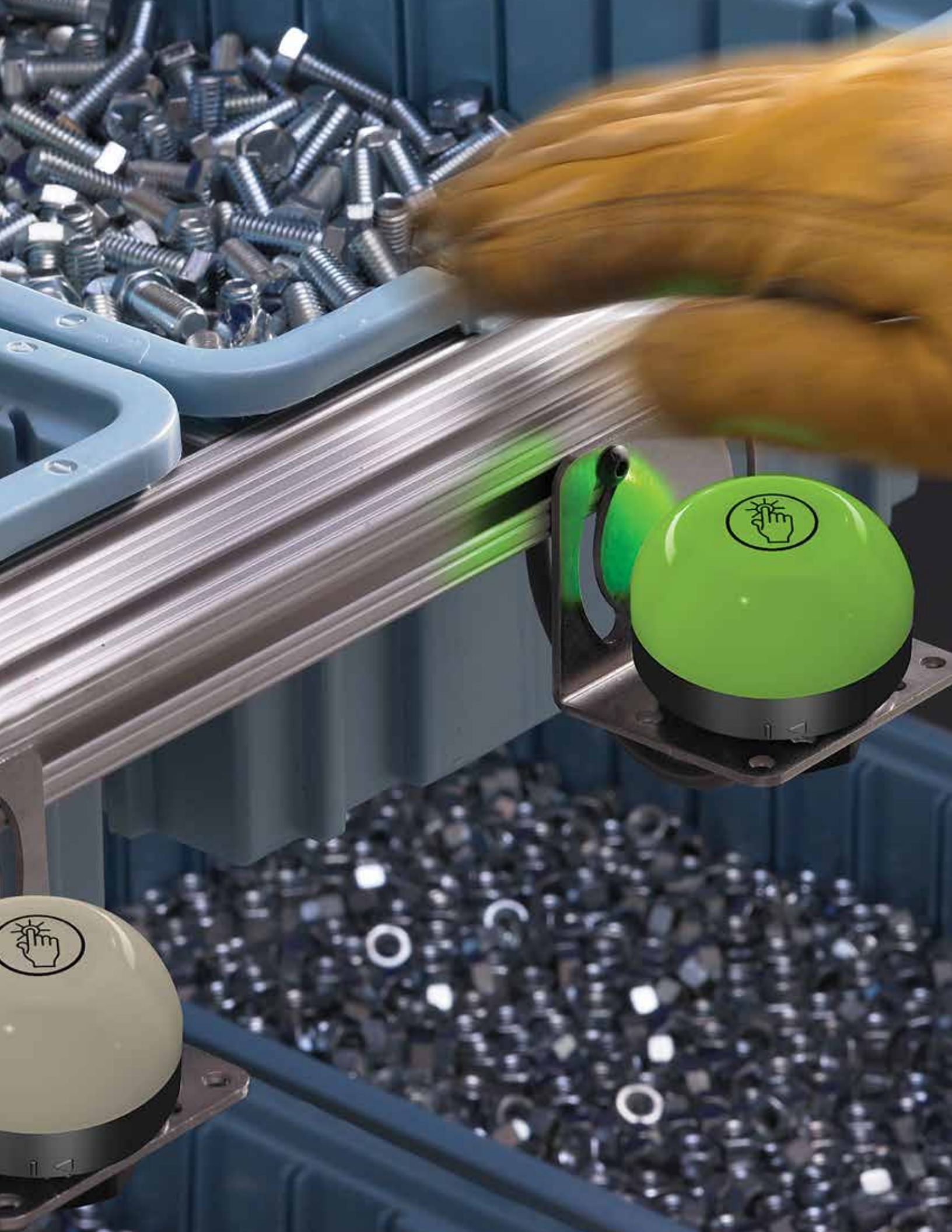


**SMBSP350 (Tabs only)**



**4-Pin M12/Euro-Style**  
straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')





# Touch Buttons and Pick-to-Light

Banner is the leader in ergonomic, visual and sealed operator touch buttons for industrial applications. Since Banner Touch Buttons can have multiple colors and I/O capabilities, they can replace several conventional buttons, making them ideal in lean manufacturing environments.

Pick-to-light sensors help industrial automation manufacturers reduce the risk of error in the assembly process, boosting product quality and reducing cost.

# Selection Guide



Touch Buttons

Page	102	104	106	108	110	112	114	116	118
Family Name	S22	K30	K50	K70	K30L/K50L Push Button	OTB	VTB	Illuminated E-Stops	Flush-Mount Illuminated E-Stops
Size (mm)	20 mm surface	30 mm dome	50 mm dome	70 mm dome	30/50 mm dome	74.2 x 59.9 x 43.2	73.3 x 43.2 x 43.2	119.8 x ø 80	102.1 x 80.8 x 80.3
Actuation Method									
Color Available									
Multicolor Option									
IP Rating	IP66, IP67, IP69K	IP67, IP69K	IP67, IP69K	IP65	IP65	IP66	IP66	IP65	IP65
Logic Function	F2, H	F2, H	F2, H	F2, H					



Pick-to-Light

102	120	122	124	126	128	130	132	136	134
S22	K30	K50	K70L	K50 Optical	K50 Modbus	K30/K50/K80 Push Button	PVD	PVL	PVA
20 mm surface	30 mm dome	50 mm dome	70 mm dome	50 mm dome	50 mm dome	30/50/50 mm dome	137.8 or 266.4	327.5 or 608	137.8 to 416.6
					or				
IP66, IP67, IP69K	IP67, IP69K	IP67, IP69K	IP65	IP67, IP69K	IP67	IP67	IP62	IP50	IP62
C, E, C3, C4	C, D, E	C, D, E C3, C4	C, D, E C3, C4	C, D, E C3, C4	S1	C, D, E C3, C4			





# Logic Functions

Illuminated buttons are available with different logic options to solve a variety of applications with optimized wiring. Multicolor models provide clear operator guidance to improve speed and accuracy.

**PICK-TO-LIGHT:** Two-color logic options for error-proofing, picking, putting and verification

- C** | Input activates Color 1. Touch activates Color 2 and Output.
- D** | Input activates Color 1. Touch activates Output.
- E** | Input activates Color 1. Touch activates Output. Touch with inactive input activates Color 2.

**MULTIPURPOSE:** Full color control via three inputs independent of button; momentary output follows button

- F2** | Three inputs activate three colors. Color 3 overrides Colors 1 and 2, and Color 2 overrides Color 1. Touch changes output state.

**ILLUMINATED BUTTONS:** One or two colors with momentary or latching bipolar outputs that follow button

- H** | Power activates Color 1. Touch changes bipolar output state and activates Color 2. Latch and momentary options.

**SPECIALTY PICK-TO-LIGHT:** Three-color logic options for error-proofing, picking, putting and verification

- C3** | Input activates Color 1. Touch with active input activates Color 3 and Output. Touch with inactive input activates Color 2 and Output.
- C4** | Input activates Color 1. Touch with active input activates Color 3 and Output. Touch with inactive input activates Color 2 and Output for 5 seconds.

**MODBUS:** Color control and input monitoring via Modbus RTU

- S1** | Modbus commands activate Colors. Touch activates Modbus output.

# Actuation Methods

The actuation method is the means by which an operator's actions are sensed. Banner's Pick-to-Light line includes a variety of actuation methods, including contact and non-contact sensors covering a single point on a small bin or a wide opening on a large bin. These actuation methods enable error proofing in a large variety of assembly and kitting applications. Below is a description of each actuation method offered to help you select the best solution for your specific application.



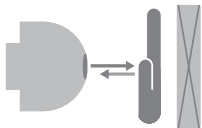
## Push Buttons

Push buttons take physical force to press and actuate the button.



## Touch Buttons

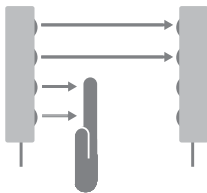
Touch buttons can be actuated with no force, just contact with the surface. The contact can be made with a whole hand, palm or finger.



## Fixed-Field Mode

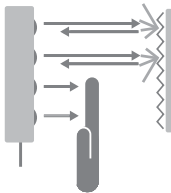
Background suppression sensors have a definite limit to their sensing range, ignoring objects that lie beyond their range.

Fixed-field sensors compare the amount of reflected light that is seen by two differently aimed receiver elements. If the light reaching the second receiver element is equal to or greater than the light reaching the first receiver element, then the object will be recognized.



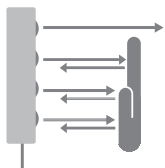
## Emitter/Receiver

In opposed-mode sensing, the sensor's emitter and receiver are housed in two separate units. The emitter is placed opposite the receiver, so that the light beam goes directly from the emitter to the receiver.



## Retroreflective Mode

Retroreflective sensors contain both the emitter and receiver elements. The beam(s) is(are) established between the emitter, the retroreflector and the receiver. An object is sensed when it interrupts or "breaks" the effective beam.



## Diffuse

With a diffuse-mode sensor, the object is detected when the object reflects the sensor's transmitted light energy back to the sensor.

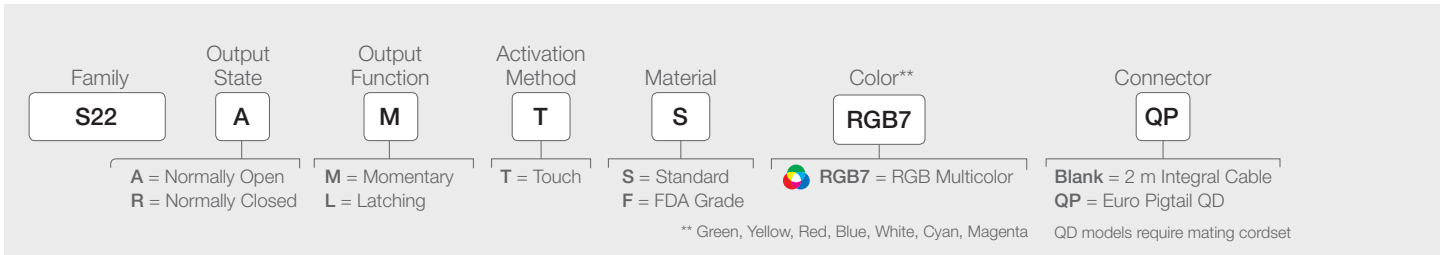


## S22 Flush-Mount Touch Buttons

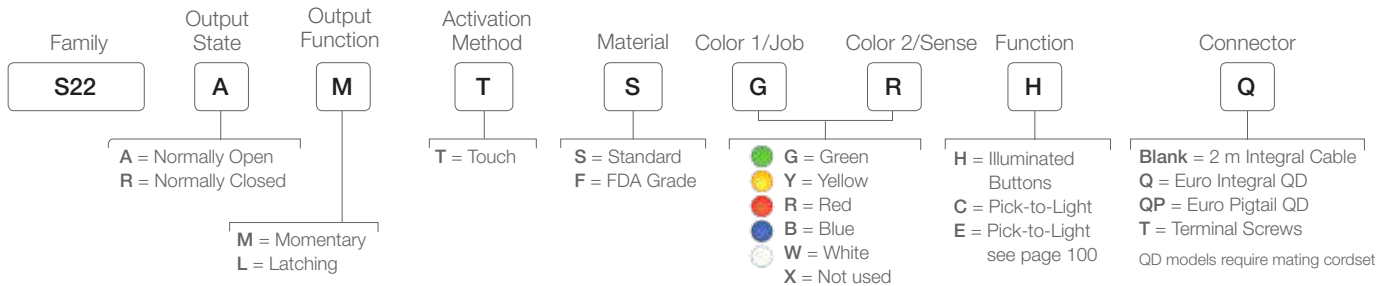
---

- Large, bright illuminated area for clear visibility of input and touch status
- Flush mount design sits tight against panel, machine and bracket surfaces
- Independent color control or preconfigured models to suit your indication needs
- Momentary versions remain activated as long as touch is present, while latching versions toggle between activated and not activated states on successive touches
- Excellent immunity to false triggering by water spray, detergents, oils, and other foreign materials
- Rugged, water-resistant IP69K design for washdown environments
- Ergonomically designed to eliminate hand, wrist and arm stresses, requiring no physical pressure to operate and can be actuated with bare hands or work gloves

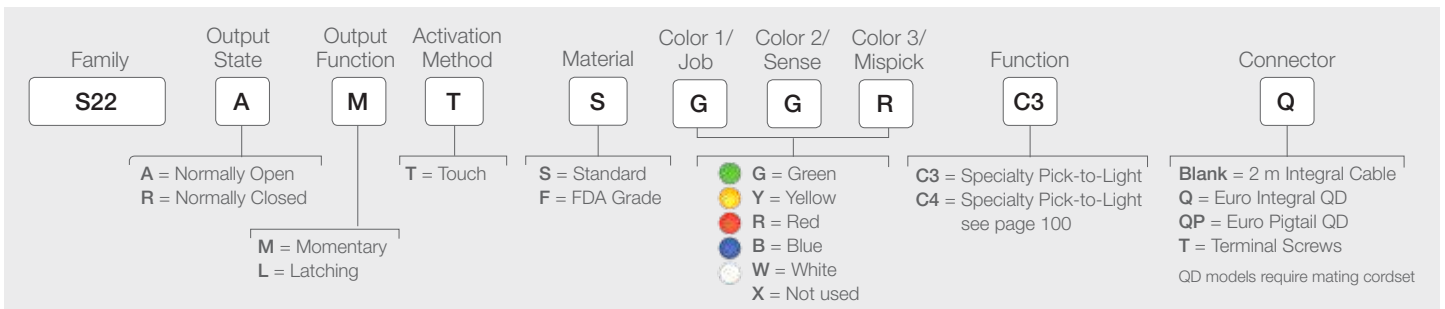
## RGB Multicolor





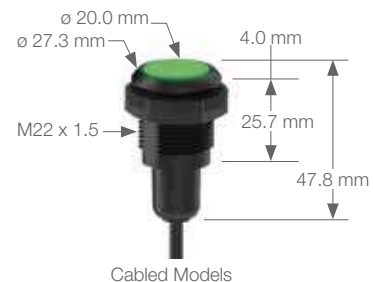
## One- or Two-Color/Function



## One-, Two-, or Three Color/Function



<b>Supply Voltage</b>	10 to 30 V dc
<b>Supply Current</b>	80 mA max current (exclusive of load)
<b>Supply Protection Circuitry</b>	Protected against reverse polarity and transient voltages
<b>Construction</b>	Housing: Polycarbonate or FDA grade plastic, depending on model Translucent dome: Polycarbonate or FDA grade plastic, depending on model Mounting Nut: PBT or FDA grade plastic
<b>Environmental Rating</b>	Standard: UL Type 4x, 13 FDA Grade: UL Type 4x (indoor) Cable, Pigtail, QD models: IEC IP66, IP67, IP69K per DIN 40050-9 on front and back Terminal models: IEC IP66, IP67, IP69K per DIN 40050-9 on front only
<b>Connections</b>	2 m PVC integral cable, integral Euro-style QD 150 mm Euro-style pigtail QD or terminal screws
<b>Operating Conditions</b>	Temperature: -40 to +50 °C Storage Temperature: -40 to +70 °C
<b>Certifications</b>	 



Cabled Models



QD Models



Field-Wired Models (Terminals)

Laser Marking Available



SMB22A



SMB22FVK



SMBAMS22P

**5-Pin Euro-Style**  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')

**5-pin M12 Euro-Style Washdown Cordset**  
Straight connector models only

**MQDC-WDSS-0506**  
2 m (6.5')  
**MQDC-WDSS-0515**  
5 m (15')  
**MQDC-WDSS-0530**  
9 m (30')



## K30 Illuminated Touch Buttons

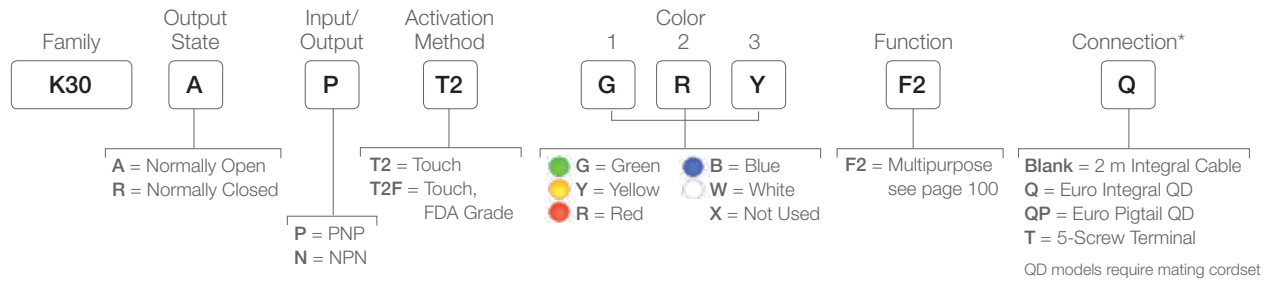
---

- Ergonomic design requires no physical pressure to operate, preventing stress on hands and wrists
- Simple operation with the touch of a finger
- Easily actuated with bare hands or work gloves
- Rugged, fully encapsulated IP69K construction for high-pressure wash-down environments
- Models with either latching or momentary outputs
- 1-, 2-, or 3- color models available to solve a variety of applications



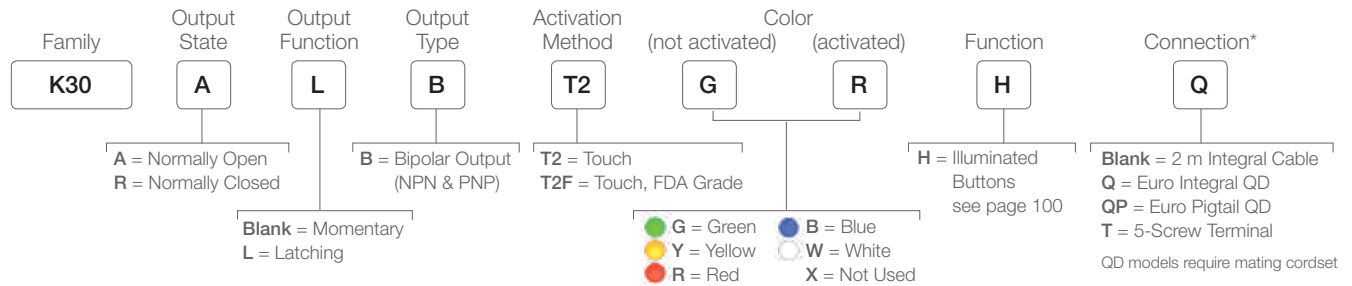
## Independent Input/Output Models with up to Three Indicator Colors Controlled by Separate Inputs

The output is activated by touching the device and is totally independent of the indicator inputs.



## One- or Two-Color Momentary or Latching Bipolar (1 NPN and 1 PNP) Output Models

These models do not have inputs to control the indicator. The color of the indicator is determined by the non-activated or activated condition.



\* FDA Grade models only available with pigtail QD

Supply Voltage	12 to 30 V dc
Construction	Housing: Polycarbonate Translucent dome: Polycarbonate Mounting Nut: PBT
Environmental Rating	IEC IP67, IP69K per DIN 40050
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Certifications	 



Laser Marking Available



4-Pin M12/Euro-Style  
Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC-406RA)



**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')



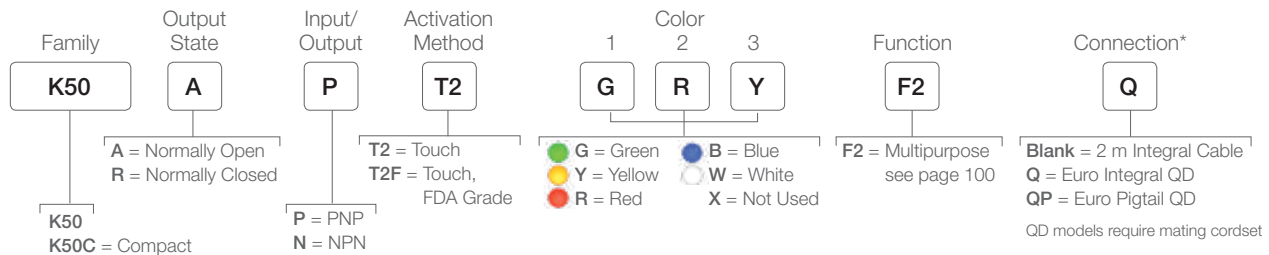
## K50 Illuminated Touch Buttons

---

- Ergonomic design requires no physical pressure to operate, preventing stress on hands and wrists
- Simple operation with the touch of a finger, hand or whole palm
- Easily actuated with bare hands or work gloves
- Rugged, fully encapsulated IP69K construction for high-pressure wash-down environments
- Models with either latching or momentary outputs
- One-, two- and three-color models available to solve a variety of applications
- Smart electric field sensing on second generation models provides excellent immunity to false triggering from water spray, detergents and other foreign materials
- Second generation models feature superior electrical noise immunity
- Models made with food-grade materials available

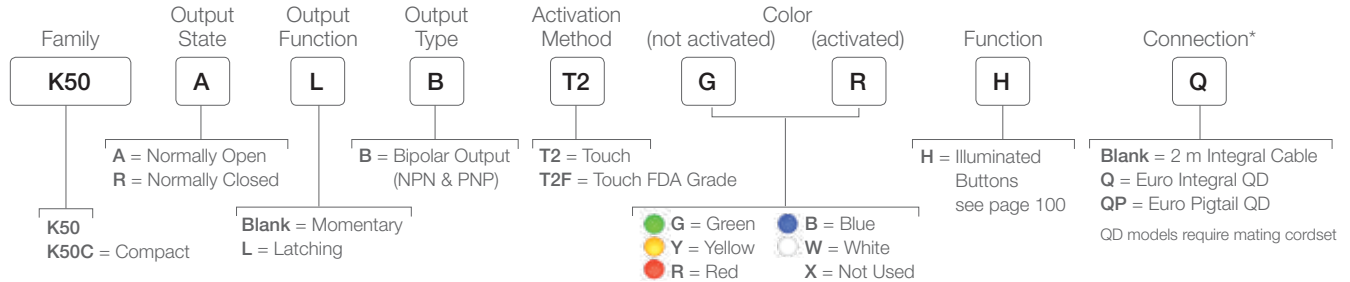
## Independent Input/Output Models with up to Three Indicator Colors Controlled by Separate Inputs

The output is activated by touching the device and is totally independent of the indicator inputs.



## One- or Two-Color Momentary or Latching Bipolar (1 NPN and 1 PNP) Output Models

These models do not have inputs to control the indicator. The color of the indicator is determined by the non-activated or activated condition.



\* FDA Grade models only available with pigtail QD

Supply Voltage	12 to 30 V dc
Construction	Housing: Polycarbonate Translucent dome: Polycarbonate Mounting Nut: PBT
Environmental Rating	Standard: UL Type 4x, 13 FDA Grade: UL Type 4x IEC IP67, IP69K per DIN 40050
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Certifications	



Laser Marking Available



### 4-Pin M12/Euro-Style

For use with K30 models

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-406RA)

- MQDC-406 2 m (6.5')
- MQDC-415 5 m (15')
- MQDC-430 9 m (30')

### 5-Pin M12/ Euro-Style

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

- MQDC1-506 2 m (6.5')
- MQDC1-515 5 m (15')
- MQDC1-530 9 m (30')

### 8-Pin M12/Euro-Style

For use with 3 color F2 models.

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC2S-806RA)

- MQDC2S-806 2 m (6.5')
- MQDC2S-815 5 m (15')
- MQDC2S-830 9 m (30')

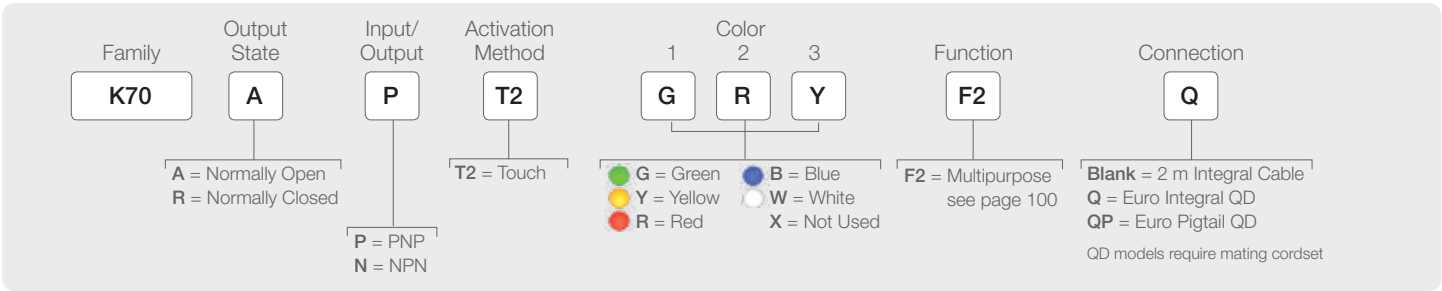


## K70 Illuminated Touch Button

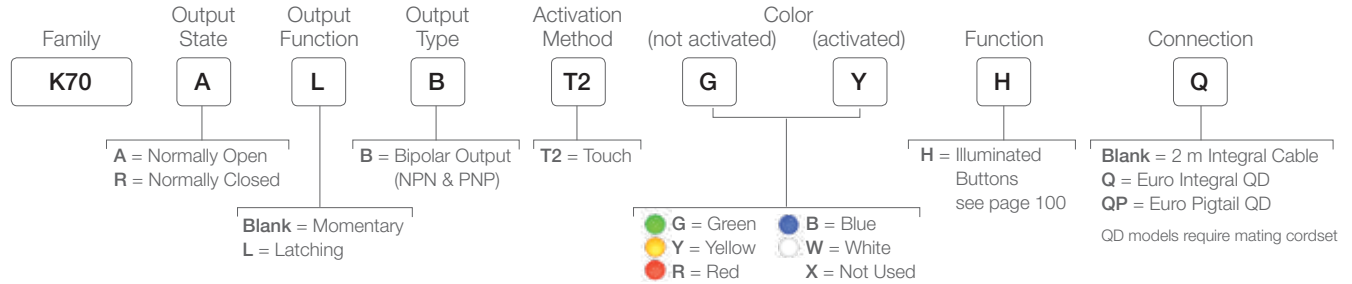
---

- Excellent immunity to false triggering by water spray, detergents, oils, and other foreign materials
- Ergonomically designed to eliminate hand, wrist, and arm stresses associated with repeated switch operation; require no physical force to operate
- Can be actuated with bare hands or work gloves
- Rugged IP65 polycarbonate construction
- Momentary versions remain activated as long as touch is present
- Latching versions start up not activated and toggle between activated and not activated on successive touches
- Available in five color options and one-, two- and three-color models
- Wireless models simplify installation and provide a simple operator interface for pick-to-light, call button and general industrial applications

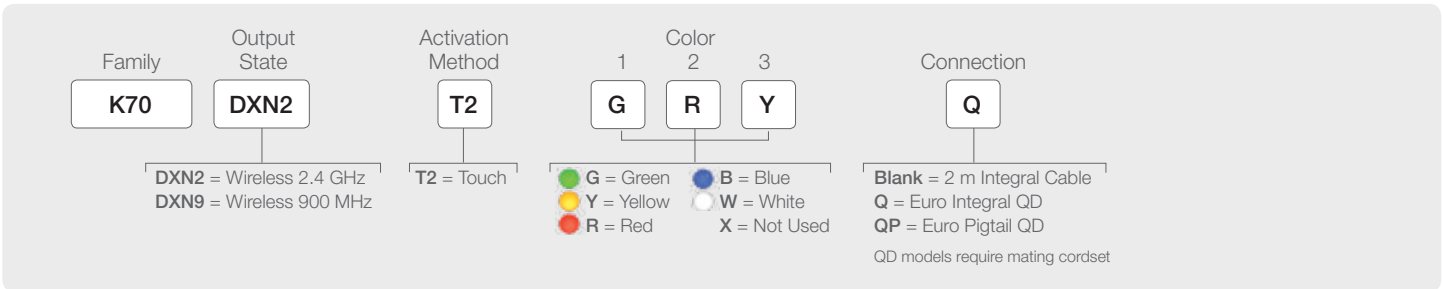
## Independent Input/Output Models with up to Three Indicator Colors Controlled by Separate Inputs



## One- or Two-Color Momentary or Latching Bipolar (1 NPN and 1 PNP) Output Models



## Wireless



### Supply Voltage and Current

12 V to 30 V dc; 220 mA Max. at 12 V dc;  
110 mA Max. at 30 V dc

### Supply Protection Circuitry

Protected against transient voltages

### Construction

Housing: Polycarbonate  
Dome: Polycarbonate

### Environmental Rating

IEC IP65

### Operating Temperature

-40 to 50 °C

### Certifications



Laser  
Marking  
Available



SMB30A



SMB30MM



SMBAMS30P



SSA-MBK-EEC1



### 5-Pin M12/Euro-Style

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC1-506RA)

MQDC1-506  
2 m (6.5')  
MQDC1-515  
5 m (15')  
MQDC1-530  
9 m (30')

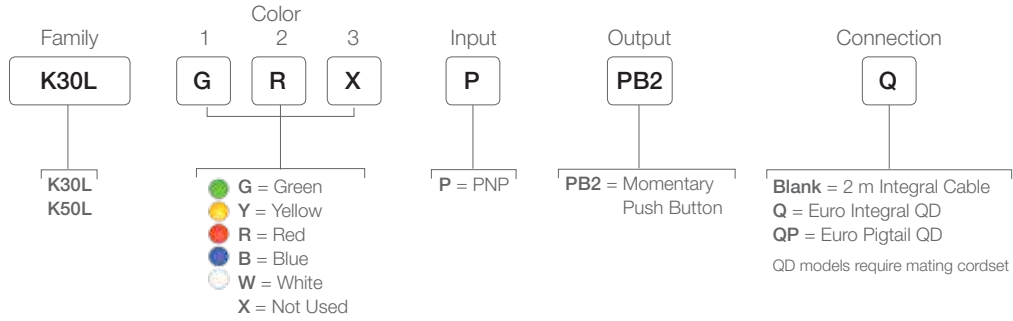




## K50L and K30L Illuminated Push Buttons

---

- Three sourcing inputs control the green, yellow and red indicator lights
- Ideal for use in abusive environments, featuring rugged, fully encapsulated construction
- Cabled and Euro Quick Disconnect models available
- Available in momentary push button output



**Supply Voltage**

K30L: 10 to 30 V dc  
K50L: 12 to 30 V dc

**Construction**

Base: Polycarbonate  
Translucent dome: Polycarbonate  
Push button: Thermoplastic

**Environmental Rating**

IEC IP65

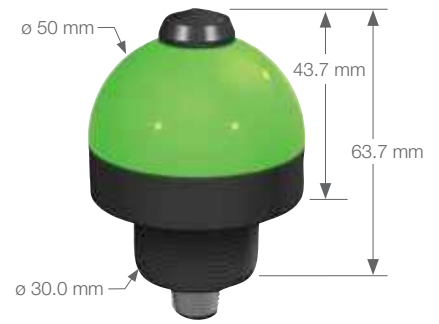
**Operating Temperature**

-40 to +50 °C (-40 to +122 °F)

**Certifications**



K30 Push Models



K50 Push Models



**SMBCK30**  
use with K30L  
on 28 mm pipe



**SMB22A**  
use with K30L



**SMB30A**  
use with K50L



**4-Pin M12/Euro-Style**

For use with K30 models

Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')

**5-Pin M12/ Euro-Style**

Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC1-506RA)

**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')

**8-Pin M12/Euro-Style**

For use with 3 color F2 models.

Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC2S-806RA)

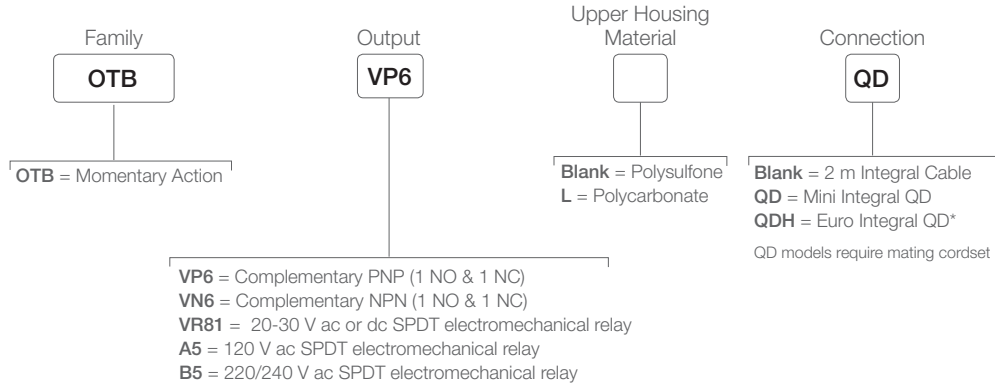
**MQDC2S-806**  
2 m (6.5')  
**MQDC2S-815**  
5 m (15')  
**MQDC2S-830**  
9 m (30')






## OTB Optical Touch Buttons

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- OPTO-TOUCH Optical Touch Buttons are zero-force ergonomic replacements for mechanical push buttons.
- OTB models are momentary-action touch buttons with electromechanical relay or solid-state outputs.



\* Only available for OTBV6P or OTBV6N models

<b>Supply Voltage</b>	Models for 105 to 130 V ac, 210 to 250 V ac (50/60 Hz), 10 to 30 V dc, or 20 to 30 V ac/dc
<b>Construction</b>	Upper Housing: Black polysulfone or Polycarbonate Base: Fiber-reinforced PBT
<b>Environmental Rating</b>	IEC IP66 NEMA 1, 3, 4X, 12 and 13
<b>Operating Temperature</b>	-20 to +50°C (-4 to +122°F)
<b>Certifications</b>	  



SMB30A



SMB30MM



SMB30SC

**Optional Field Covers**



- Black OTC-1-BK
- Green OTC-1-GN
- Red OTC-1-RD
- Yellow OTC-1-YW



- Black OTCL-1-BK
- Green OTCL-1-GN
- Red OTCL-1-RD
- Yellow OTCL-1-YW

**4-Pin M12/  
Euro-Style**

Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-406RA)



- MQDC-406  
2 m (6.5')
- MQDC-415  
5 m (15')
- MQDC-430  
9 m (30')

**4-Pin Mini-Style**



- MBCC-406  
1.83 m (6')
- MBCC-412  
3.66 m (12')
- MBCC-430  
9.14 m (30')

**5-Pin Mini-Style**

- MBCC-506  
1.83 m (6')
- MBCC-512  
3.66 m (12')
- MBCC-530  
9.14 m (30')



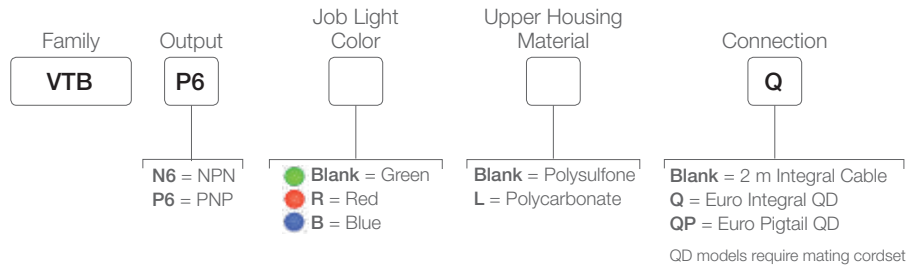
## VTB Verification Touch Buttons

---

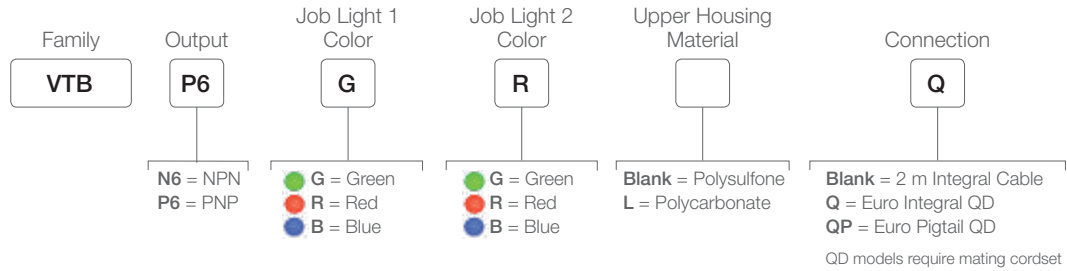
- Replaces capacitive touch switches and mechanical push buttons
- Features illuminated base (to provide a bright, easy-to-see job light) solid, flashing or multiple color models available
- Offers choice of models with red, green or blue job light
- Require no physical pressure to operate, eliminating hand, wrist and arm stresses associated with repeated switch operation
- Offers a cost-effective and easy-to-install pick-to-light solution for areas that cannot accommodate a light screen
- Cuts through heavy airborne contamination to function in almost any environment
- Withstands exposure to a variety of chemicals, depending on model



## One-Color Illuminated Base Models



## Two-Color Illuminated Base Models



Supply Voltage	12 to 30 V dc
Construction	Upper Housing: Polysulfone or polycarbonate Base: White polycarbonate
Environmental Rating	IP66
Operating Temperature	-20 to +50 °C (-4 to +122 °F)
Certifications	



SMB30MM      SMB30FA      SMB30SC      SMBAMS30RA

**4-Pin M12/Euro-Style**  
For use with K30 models

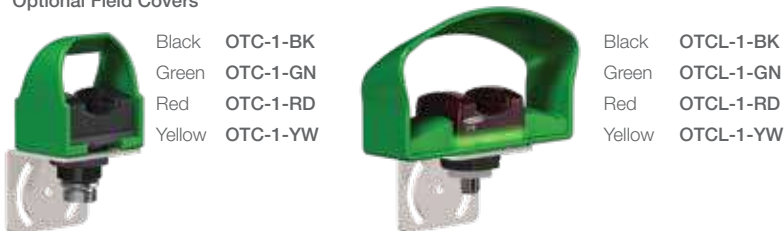
Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC-406RA)

**MQDC-406**  
2 m (6.5')  
**MQDC-415**  
5 m (15')  
**MQDC-430**  
9 m (30')

**5-Pin M12/ Euro-Style**  
Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC1-506RA)

**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')

### Optional Field Covers







## 30 mm Mount Illuminated E-Stops

---

- Available with two-color: yellow and red, one color: red
- Reduces intensive labor costs with a fully enclosed E-Stop button ready for installation
- Multiple buttons can be wired in series, with built-in logic allowing for clear indication of pushed button
- Latching design complies with ISO 13850 direct (positive) opening operation per IEC 60947-5-1
- Rugged design rated to IP65
- Available with illuminated Safety BUS Gateway compatibility

Model*	Description	Illumination	Model*	Description	Illumination
SSA-EB1PLYR-12ECQ8	2NC / 1NO (PNP)	YEL/RED-Flash/Solid	SSA-EB1PLYR-02ECQ5B	2NC – Safety BUS node compatible	YEL/RED-Flash
SSA-EB1PLGR-12ECQ8	2NC / 1NO (PNP)	GREEN/RED-Flash/Solid	SSA-EB1PLXR-02ECQ5A	2NC – Safety BUS node compatible	OFF/RED-Flash
SSA-EB1PLXR-12ECQ8	2NC / 1NO (PNP)	OFF/RED-Flash/Solid	SSA-EB1PLXR-02ECQ5B	2NC – Safety BUS node compatible	OFF/RED-Flash
SSA-EB1PL-12ECQ8	2NC / 1NO (PNP)	OFF/RED-Solid/Solid	SSA-EB1PL-02ECQ5A	2NC – Safety BUS node compatible	OFF/RED-Solid
SSA-EB1PLYR-02ECQ5A	2NC – Safety BUS node compatible	YEL/RED-Flash	SSA-EB1PL-02ECQ5B	2NC – Safety BUS node compatible	OFF/RED-Solid

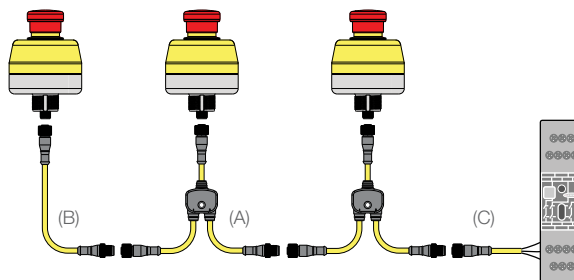
\* Washdown cover can be ordered separately or ad -WC to the end of the model number

Supply Voltage	12 to 30 V dc
Construction	Upper Housing: Polycarbonate/Polymide Base: White polycarbonate
Environmental Rating	IP65, IP69K with cover
Operating Temperature	Temperature: -25 to +55 °C (-13 to +131 °F) Humidity: 45% to 85% RH (no condensation)
Certifications	 



### CSS Series Hookup Cordset Solution

This interconnection solution allows for quick hookup of a series string of emergency stop buttons. The user must ensure that the CSS series hookup cordsets are installed so that they cannot be easily defeated by not allowing access to the QD connectors or allowing improper connection bypassing the function of the Emergency Stop.



SSA-MBK-EEC1



SSA-MBK-EEC2



SSA-MBK-EEC3

Cordsets available on page 119



## Flush-Mount Illuminated E-Stop Buttons

---

- Available with two-color: yellow (or green) and red or one color: red
- Rugged design rated to IP65
- Available with illuminated Safety BUS Gateway compatibility
- Latching design complies with ISO 13850 direct (positive) opening operation per IEC 60947-5-1
- Safe Break Action ensures NC contacts will open if the contact block is separated from the actuator
- Multiple buttons can be interfaced and series connected with CSS Series Hookup Cordsets
- Compliant with ANSI B11.19, ANSI NFPA79, and IEC/EN 60204-1 Emergency Stop requirements

## Illuminated Flush-mount E-Stop Push-Buttons

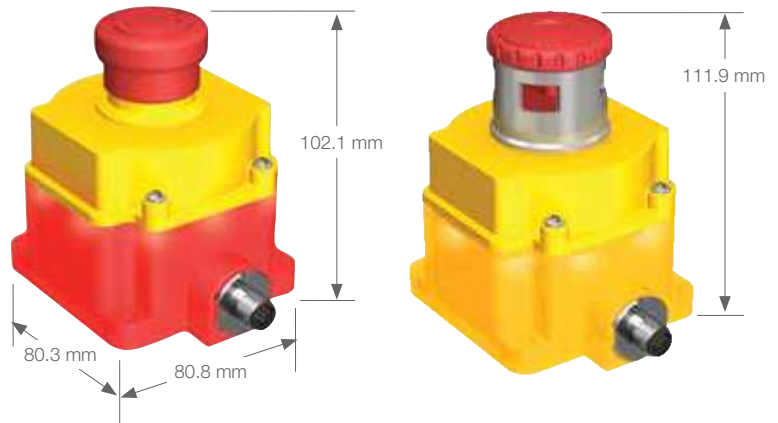
Model	Description	Illumination	Model	Description	Illumination
SSA-EB1PLYR-12ED1Q8	2NC / 1NO (PNP)	YEL/RED-Flash/Solid	SSA-EB1PLYR-02ED1Q5B	2NC – Safety BUS node compatible	YEL/RED-Flash
SSA-EB1PLGR-12ED1Q8	2NC / 1NO (PNP)	GREEN/RED-Flash/Solid	SSA-EB1PLXR-02ED1Q5A	2NC – Safety BUS node compatible	OFF/RED-Flash
SSA-EB1PLXR-12ED1Q8	2NC / 1NO (PNP)	OFF/RED-Flash/Solid	SSA-EB1PLXR-02ED1Q5B	2NC – Safety BUS node compatible	OFF/RED-Flash
SSA-EB1PL-12ED1Q8	2NC / 1NO (PNP)	OFF/RED-Solid/Solid	SSA-EB1PL-02ED1Q5A	2NC – Safety BUS node compatible	OFF/RED-Solid
SSA-EB1PLYR-02ED1Q5A	2NC – Safety BUS node compatible	YEL/RED-Flash	SSA-EB1PL-02ED1Q5B	2NC – Safety BUS node compatible	OFF/RED-Solid

## Lockable Illuminated Flush-mount E-Stop Push-Buttons

Model	Description	Illumination	Model	Description	Illumination
SSA-EB1MLYRP-12ED1Q8	2NC / 1NO (PNP)	YEL/RED-Flash/Solid	SSA-EB1MLXRP-12ED1Q8	2NC / 1NO (PNP)	OFF/RED-Flash/Solid
SSA-EB1MLGRP-12ED1Q8	2NC / 1NO (PNP)	GREEN/RED-Flash/Solid	SSA-EB1MLP-12ED1Q8	2NC / 1NO (PNP)	OFF/RED-Solid/Solid

E-stops can be cascaded.  
See diagram on page 117.

Supply Voltage	12 to 30 V dc
Construction	Upper Housing: Polycarbonate/Polymide Base: White polycarbonate
Environmental Rating	IP65
Operating Temperature	Temperature: -25 to +55 °C (-13 to +131 °F) Humidity: 45% to 85% RH (no condensation)
Certifications	CE



Illuminated Flush-mount Model

Lockable Illuminated Flush-mount Model

4-Pin M12/  
Euro-Style  
Straight connector  
models listed



MQDC-406  
2 m (6.5')  
MQDC-415  
5 m (15')  
MQDC-430  
9 m (30')

5-Pin Double-Ended  
Euro-Style  
(Male/Female)



DEE2R-51D	DEE2R-525D
0.31 m (1')	7.62 m (25')
DEE2R-53D	DEE2R-550D
0.91 m (3')	15.2 m (50')
DEE2R-58D	DEE2R-575D
2.44 m (8')	22.9 m (75')
DEE2R-515D	DEE2R-5100D
4.57 m (15')	30.5 m (100')

8-Pin M12/  
Euro-Style  
Straight connector  
models listed



MQDC2S-806  
2 m (6.5')  
MQDC2S-815  
5 m (15')  
MQDC2S-830  
9 m (30')

8-Pin Double-Ended  
Euro-Style  
(Male/Female)

DEE2R-81D	DEE2R-825D
0.31 m (1')	7.62 m (25')
DEE2R-83D	DEE2R-850D
0.91 m (3')	15.2 m (50')
DEE2R-88D	DEE2R-875D
2.44 m (8')	22.9 m (75')
DEE2R-815D	DEE2R-8100D
4.57 m (15')	30.5 m (100')

4-Pin M12  
Euro-Style Splitter  
(Female/Male/Female)



CSS-M12F41M12M41M12F41

8-Pin M12  
Euro-Style Splitter  
(Female/Male/Female)

CSS-M12F81M12M81M12F81





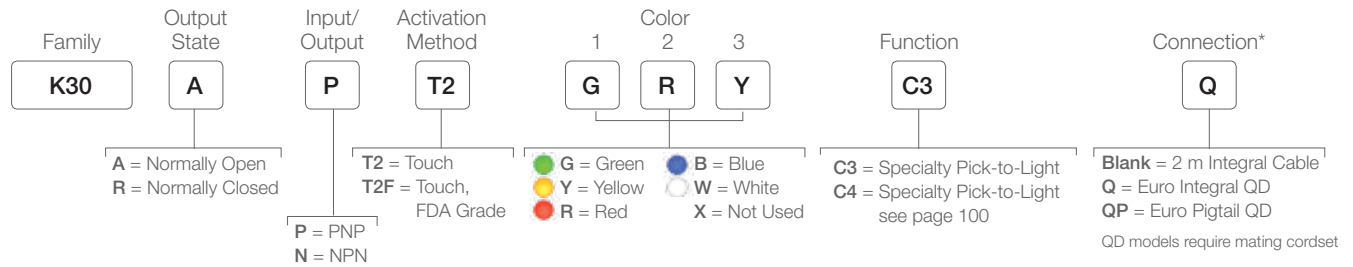
## K30 Pick-to-Light Touch Buttons

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- Ergonomic design requires no physical pressure to operate, preventing stress on hands and wrists
- Simple operation with the touch of a finger; easily actuated with bare hands or work gloves
- Rugged, fully encapsulated IP69K construction for high-pressure wash-down environments; Models with food grade materials available
- Models with either latching or momentary outputs
- Ideal for pick-to-light and call button applications in a variety of industries
- One-, two-, or three-color models available to solve a variety of applications
- Smart electric field sensing provides excellent immunity to false triggering from water spray, detergents and other foreign materials
- Superior electrical noise immunity

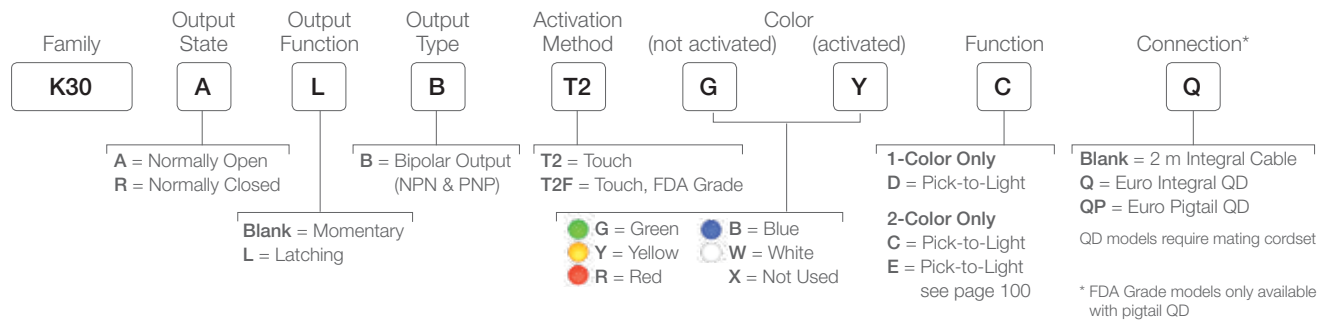
## Independent Input/Output Models with up to Three Indicator Colors Controlled by Separate Inputs

The output is activated by touching the device and is totally independent of the indicator inputs.



## One- or Two-Color Momentary or Latching Bipolar (1 NPN and 1 PNP) Output Models

These models do not have inputs to control the indicator. The color of the indicator is determined by the non-activated or activated condition.



### Supply Voltage

12 to 30 V dc

### Construction

Housing: Polycarbonate  
Translucent dome: Polycarbonate  
Mounting Nut: PBT

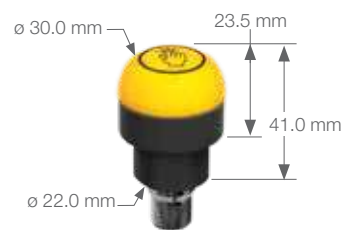
### Environmental Rating

IEC IP67, IP69K per DIN 40050

### Operating Temperature

-40 to +50 °C (-40 to +122 °F)

### Certifications



K30 Touch



K30 Touch FDA Grade

Laser Marking Available



SMB22A



SMB22FVK



SMBAMS22P



SMB22RAVK



TC-K30-CL  
Touch Guard



4-Pin M12/Euro-Style  
Straight connector models listed; for right-angle models, add RA to the end of model number (example, MQDC-406RA)

MQDC-406  
2 m (6.5')  
MQDC-415  
5 m (15')  
MQDC-430  
9 m (30')

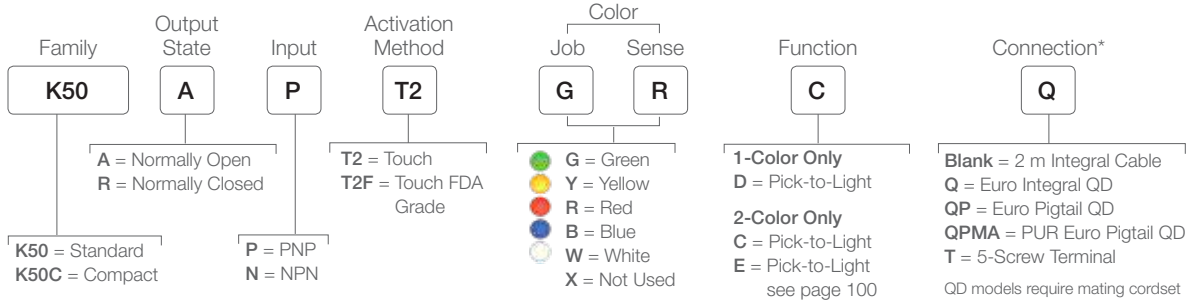


## K50 Pick-to-Light Touch Buttons

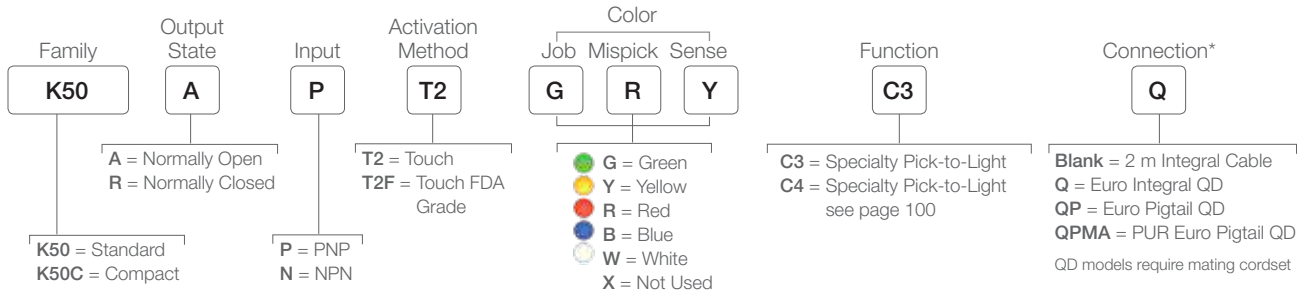
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- Ergonomic design requires no physical pressure to operate, preventing stress on hands and wrists
- Simple operation with the touch of a finger, hand or whole palm
- Easily actuated with bare hands or work gloves
- Rugged, fully encapsulated IP69K construction for high-pressure wash-down environments
- Models with either latching or momentary outputs
- Ideal for pick-to-light and call button applications in a variety of industries
- One-, two- and three-color models available to solve a variety of applications



## One- or Two-Color



## Three-Color



\* FDA Grade models only available with pigtail QD

Supply Voltage	12 to 30 V dc
Construction	Housing: Polycarbonate Translucent dome: Polycarbonate Mounting Nut: PBT
Environmental Rating	Standard: UL Type 4x, 13 FDA Grade: UL Type 4x IEC IP67, IP69K per DIN 40050
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Certifications	 



### 4-Pin M12/Euro-Style

For use with K30 models

Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC-406RA)

<b>MQDC-406</b>	2 m (6.5')
<b>MQDC-415</b>	5 m (15')
<b>MQDC-430</b>	9 m (30')

### 5-Pin M12/ Euro-Style

Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC1-506RA)

<b>MQDC1-506</b>	2 m (6.5')
<b>MQDC1-515</b>	5 m (15')
<b>MQDC1-530</b>	9 m (30')

### 8-Pin M12/Euro-Style

For use with 3 color F2 models.

Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC2S-806RA)

<b>MQDC2S-806</b>	2 m (6.5')
<b>MQDC2S-815</b>	5 m (15')
<b>MQDC2S-830</b>	9 m (30')

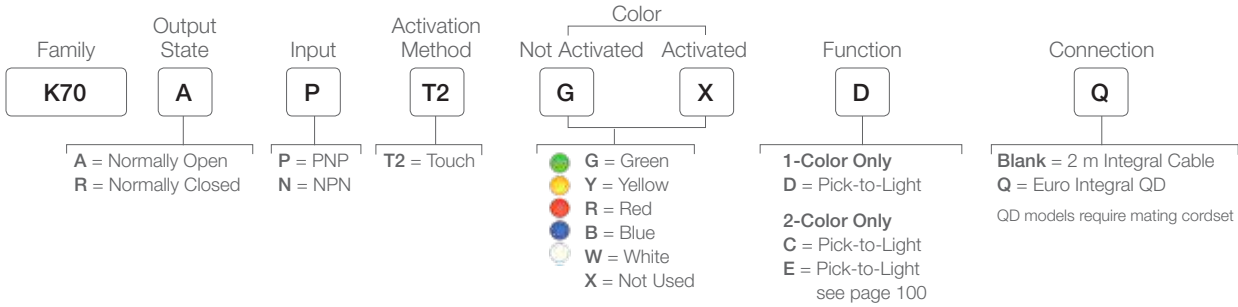


## K70 Illuminated Pick-to-Light Touch Button

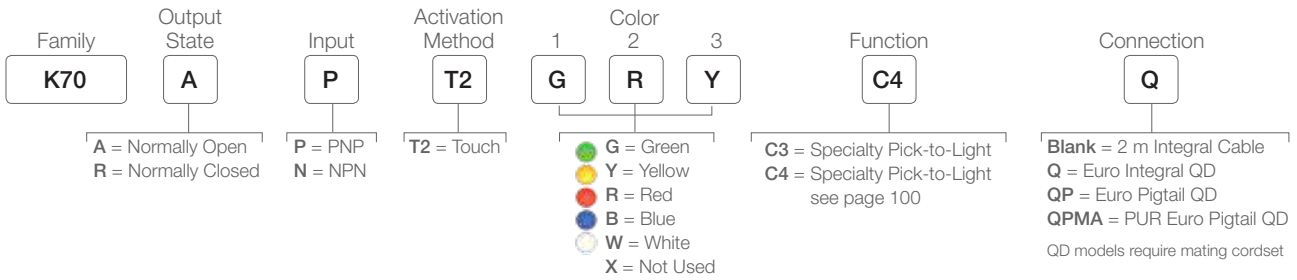
- Excellent immunity to false triggering by water spray, detergents, oils, and other foreign materials
- Ergonomically designed to eliminate hand, wrist, and arm stresses associated with repeated switch operation; requires no physical force to operate
- Can be actuated with bare hands or work gloves
- Rugged IP65 polycarbonate construction
- Momentary versions remain activated as long as touch is present
- Latching versions start up not activated and toggle between activated and not activated on successive touches
- One-, two- and three-color models available



## Pick-To-Light



## Specialty Models



### Supply Voltage and Current

12 V to 30 V dc; 220 mA Max. at 12 V dc;  
110 mA Max. at 30 V dc

### Supply Protection Circuitry

Protected against transient voltages

### Construction

Housing: Polycarbonate  
Dome: Polycarbonate

### Environmental Rating

IEC IP65

### Operating Temperature

-40 to 50 °C

### Certifications



Laser  
Marking  
Available



SMB30A



SMB30MM



SMBAMS30P



SSA-MBK-EEC1



### 5-Pin M12/Euro-Style

Straight connector models listed; for  
right-angle models, add RA to the end of  
model number (example, MQDC1-506RA)

**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')



## K50 Optical Pick-to-Light Series

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- Rugged, cost-effective and easy-to-install solutions for error-proofing and parts-verification applications
- Illuminated dome provides easy-to-see job light status
- Choose either polarized retro-reflective or fixed-field models
- Fully encapsulated IP67 construction

## One- or Two-Color Models



## Three-Color Models



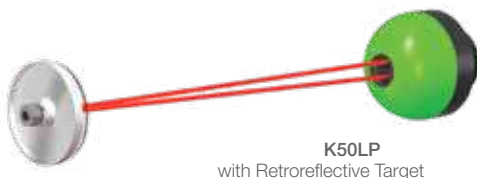
<b>Sensing Range</b>	Polarized Retroreflective: 2.0 m Fixed-field: 50 mm or 100 mm
<b>Supply Voltage</b>	12 to 30 V dc
<b>Construction</b>	Housing: Polycarbonate Translucent dome: Polycarbonate Mounting Nut: PBT
<b>Environmental Rating</b>	IEC IP67, IP69K per DIN 40050
<b>Operating Temperature</b>	-40 to +50 °C (-40 to +122 °F)
<b>Certifications</b>	CE  Some models pending. Contact factory for additional information.



SMB30A

SMB30FA

SMB30RAVK



K50LP  
with Retroreflective Target

**5-Pin M12/  
Euro-Style**  
Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC1-506RA)



**MQDC1-506**  
2 m (6.5')  
**MQDC1-515**  
5 m (15')  
**MQDC1-530**  
9 m (30')



**Retroreflective Targets**  
BRT-2X2  
BRT-35X35B  
BRT-51X51BM  
BRT-50D  
BRT-100X18A

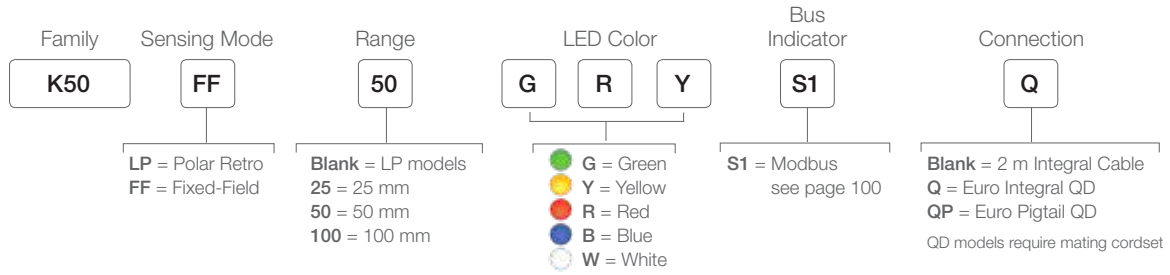
**Retroreflective Tape**  
BRT-THG-1-100  
BRT-THG-2-100  
BRT-THG-3-100  
BRT-TVHG-2X2



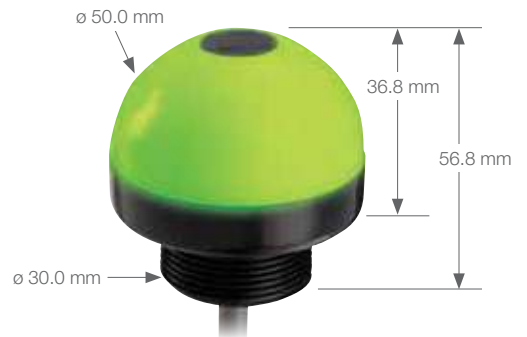
## K50 Modbus Pick-to-Light Series

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- Rugged, cost-effective and easy-to-install solutions for error-proofing and parts-verification applications
- Illuminated dome provides easy-to-see job light status
- Choose either polarized retroreflective or fixed-field models
- Fully encapsulated IP67 construction
- User can customize or select standard function configurations
- Modbus communication minimizes the cabling and system programming requirements



<b>Sensing Range</b>	Polarized Retroreflective: 2.0 m Fixed-field: 50 mm or 100 mm
<b>Supply Voltage</b>	12 to 30 V dc
<b>Construction</b>	Housing: Polycarbonate Translucent dome: Polycarbonate Mounting Nut: PBT
<b>Environmental Rating</b>	IEC IP67
<b>Operating Temperature</b>	-40 to +50 °C (-40 to +122 °F)
<b>Certifications</b>	<b>CE</b>





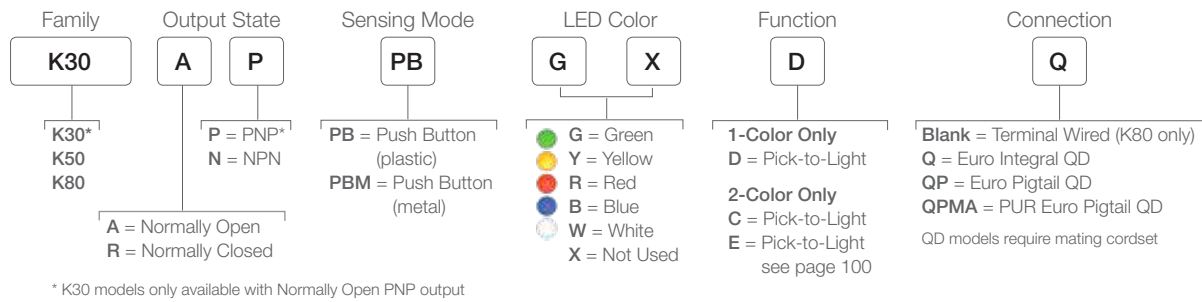


## K30/K50/K80 Push Button Pick-to-Light Series

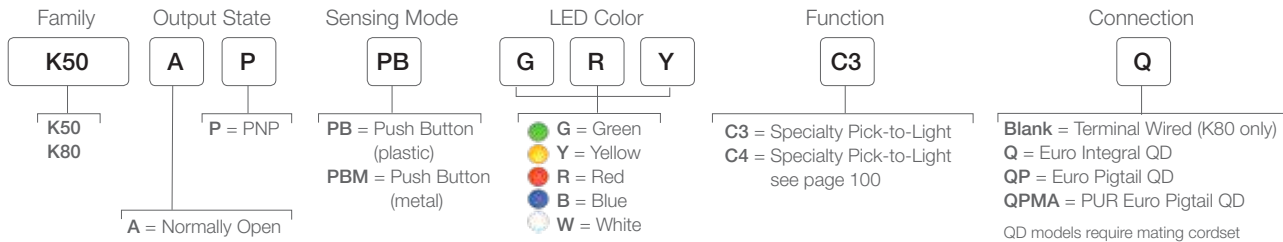
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- Illuminated dome provides an easy-to-see green job light some models also light red for alternate operation
- Up to three independent colors in one unit
- Waterproof IP65 construction for wet environments
- Immune to EMI and RFI interference
- 12 to 30 V dc operation
- Cabled and Quick Disconnect models available

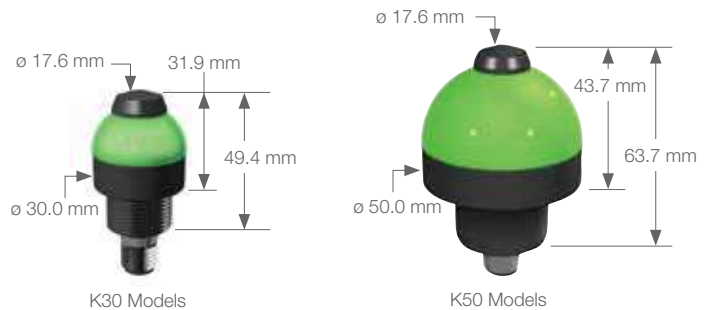
## One- or Two-Color



## Three-Color



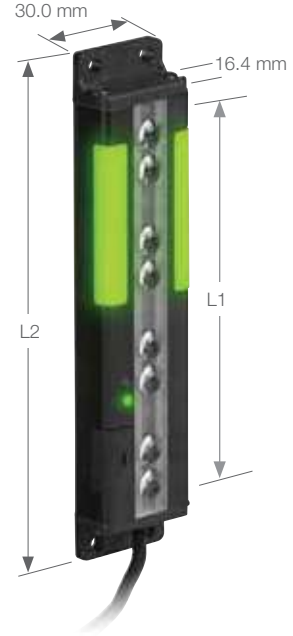
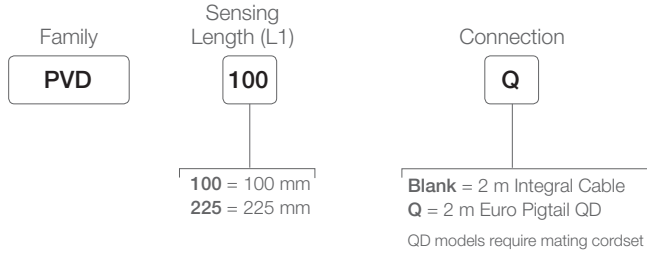
Supply Voltage	12 to 30 V dc
Construction	Base and Translucent Dome: Polycarbonate Push Button: Thermoplastic or Stainless Steel
Environmental Rating	K30: IP65 Other models: IP67
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Certifications	 



**5-Pin M12/Euro-Style**  
Straight connector models listed;  
for right-angle models, add RA  
to the end of model number  
(example, MQDC1-506RA)

MQDC1-506  
2 m (6.5')  
MQDC1-515  
5 m (15')  
MQDC1-530  
9 m (30')





<b>Sensing Range</b>	Retroreflective: 2 m Diffuse: 400 mm
<b>Supply Voltage</b>	12 to 30 V dc
<b>Construction</b>	Housing: Black painted aluminum Lenses: Acrylic End Caps: Thermoplastic Switch Cover: Thermoplastic
<b>Environmental Rating</b>	NEMA 2; IEC IP62
<b>Operating Temperature</b>	0 to +50 °C (+32 to 122 °F)
<b>Certifications</b>	

Models	No. of Beams	Sensing Length (L1)	Overall Length (L2)
PVD100	4	100 mm	137.8 mm
PVD225	8	225 mm	266.4 mm



**4-Pin M12/Euro-Style**  
 For use with K30 models  
 Straight connector models listed;  
 for right-angle models, add RA  
 to the end of model number  
 (example, MQDC-406RA)

**5-Pin M12/ Euro-Style**  
 Straight connector models listed;  
 for right-angle models, add RA  
 to the end of model number  
 (example, MQDC1-506RA)



- MQDC-406**  
2 m (6.5')
- MQDC-415**  
5 m (15')
- MQDC-430**  
9 m (30')
- MQDC1-506**  
2 m (6.5')
- MQDC1-515**  
5 m (15')
- MQDC1-530**  
9 m (30')

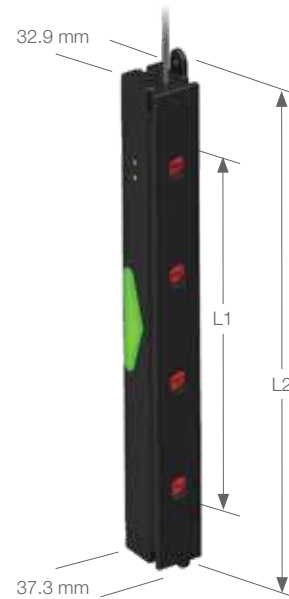
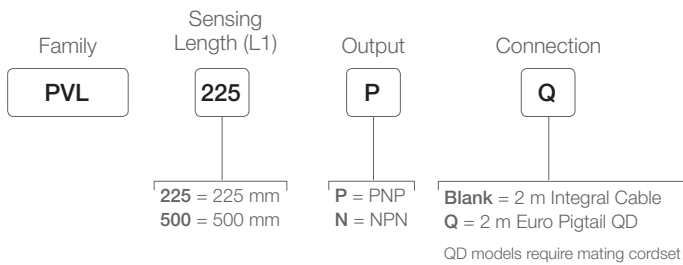


## PVL Retroreflective Parts Verification Array

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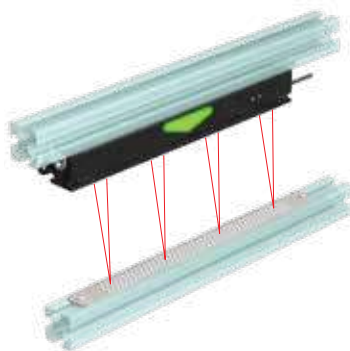
- Cost-effective coverage with the highest reliability
- Opto-mechanical alignment with bright red emitter beams allows for easy setup
- Easy installation with no assembly required
- Can mount directly to racking profile vertically or horizontally
- Rugged, metal compact housing for high durability
- Highly visible, two-color integrated job LED arrows for confirmation of correct pick or indication of mis-pick
- Retroreflective tape can be placed on adjacent unit or one of the brackets for reduced installation costs
- Large mounting holes for securing directly to slotted racking systems
- Slotted housing design allows cable to exit on either end





Sensing Range	Retroreflective: 1.5 m
Supply Voltage	12 to 30 V dc
Construction	Housing: aluminum anodized Translucent Indicator: polycarbonate
Environmental Rating	IP50
Operating Temperature	0 to +50 °C (+32 to 122 °F)
Certifications	CE

Models	No. of Beams	Sensing Length (L1)	Hole-to-Hole Length (L2)
PVL225	4	225 mm	327.5 mm
PVL500	8	500 mm	608.0 mm



SMBPVL1 and  
SMBPVL2-225 or -500



SMBPVL4 and SMBPVL3-225 or -500  
for use on 28 mm pipe



**4-Pin M12/Euro-Style**  
 Straight connector models listed;  
 for right-angle models, add RA  
 to the end of the model number  
 (example, MQDC-406RA)

**MQDC-406**  
 2 m (6.5')  
**MQDC-415**  
 5 m (15')  
**MQDC-430**  
 9 m (30')



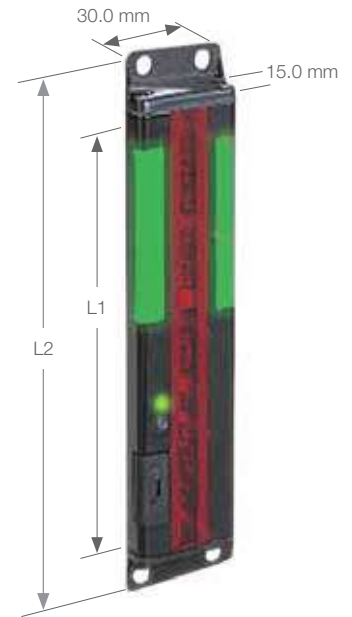
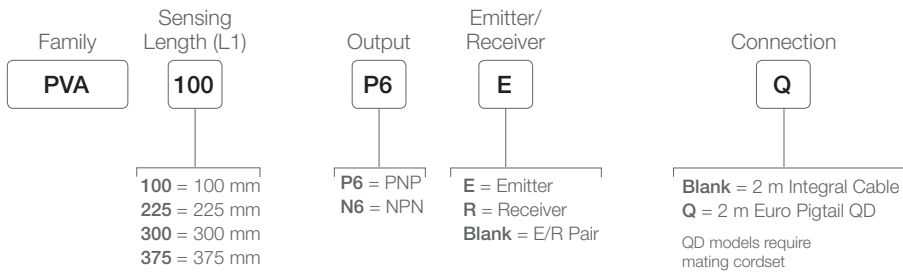
**BRT-THG-1-100**  
 Replacement retroreflective tape  
**BRT-84X84A**  
 Long Range Reflectors



## PVA Opposed-Mode Parts Verification Array

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- Compact package, available in 4 lengths to fit many sizes and configurations of existing parts bins
- Range up to 2 m (6.5 ft)
- Two-component system (asynchronous emitter and receiver) needs no sync wire or controller box.
- Clearly visible green job indicator lights mounted on either side of emitter and receiver housings; the light can be remotely controlled to initiate user action with a solid ON or blinking condition
- Two frequency settings to prevent crosstalk in close-proximity, multiple-array installations
- Heavy-duty protective brackets available



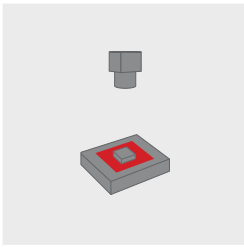
Sensing Range	2 m
Supply Voltage	12 to 30 V dc
Construction	Housing: Black painted aluminum Lenses: Acrylic End Caps: PBT Switch Cover: Thermoplastic
Environmental Rating	NEMA 2; IEC IP62
Operating Temperature	0 to +50 °C (+32 to 122 °F)
Certifications	

Models	No. of Beams	Sensing Length (L1)	Overall Length (L2)
PVA100	5	100 mm	137.8 mm
PVA225	10	225 mm	266.4 mm
PVA300	13	300 mm	341.4 mm
PVA375	16	375 mm	416.6 mm



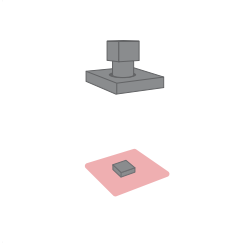
4-Pin M12/Euro-Style  
Straight connector models listed; for right-angle, add RA to the end of the model number (example, MQDC-406RA)

MQDC-406	2 m (6.5')
MQDC-415	5 m (15')
MQDC-430	9 m (30')



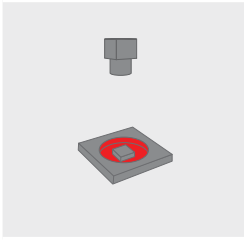
## Backlights

A part to be inspected is placed between the camera and a bright, even light source. The result creates a silhouette of the target which is useful in edge detection, part presence and measurement applications.



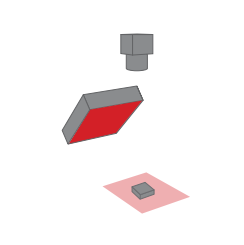
## Ring Lights

A Ring Light is affixed to the camera and both items can be mounted as one piece for convenience. This setup is useful for relatively small parts or close up applications.



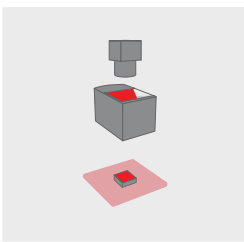
## Low-Angle Ring Lights

Also called a dark field illuminator, this specialty light has its LEDs mounted in a ring, pointing toward the part almost perpendicular to the camera's direction of view. Low-Angle Ring lights create shadows and bright spots, and are useful in detecting changes in depth.



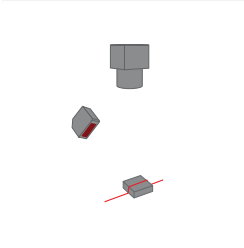
## Directional Lights

Directional lights, available in a variety of housings, create shadows to detect changes in depth, illuminate specific surface angles, and avoid glare off reflective surfaces when directed at an angle away from camera.



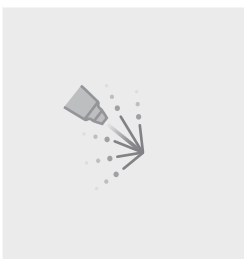
## On-Axis Lights

On-Axis, or coaxial, lights generates light that travels along the same axis as the camera's direction of view. The camera looks down from the top, through the On-Axis light, to the target part below. This technique is useful in eliminating shadows, inspecting shiny objects, or inspecting for height changes.



## Structured Lights

A laser line generator is an example of a structured lighting scheme. This technique uses a high quality, uniform laser line to infer the presence of a difficult to see target. As a three-dimensional part passes through the laser line's path, the image of the laser becomes distorted so the camera can detect the part.



## Washdown

The Banner portfolio of heavy-duty lights includes products suitable for use in washdown environments, hazardous locations, and high temperature applications. Several of these lights are resistant to common cleaning chemicals, as well being resistant to cutting oils and fluids, making them useful in harsh environments.













# Pro Editor Models



Pro Editor is ideal for those who don't have IO-Link, but who want more control and customization than a standard indicator. The Pro Editor software must be used with a Pro converter cable, which is sold separately.

IO-Link is an open standard serial communication protocol that allows for the bi-directional exchange of data from IO-Link supported sensors that are also connected through a master.

Pick-IQ is a purpose-built, Modbus compatible serial bus protocol that uses a Common ID to reduce the typical latency that results from polling multiple devices.

 <p>K50 Pro Indicator</p>	✓	✓	✓
 <p>K50 Pro Compact Indicator</p>	✓		✓
 <p>K30 Pro Indicator</p>	✓		
 <p>S22 Pro Indicator and S22 Pro Touch Button</p>	✓		
 <p>K50 Pro Touch Button</p>	✓	✓	✓
 <p>K50 Pro Touch Button with Vibration Feedback</p>	✓	✓	✓
 <p>TL50 Pro</p>	✓	✓	
 <p>WLS27 Pro</p>	✓	✓	



## WLS28-2 Multicolor

- Three and five color models cover all standard indication states with only four wires to connect
- Combine illumination and multiple indication capabilities in a single device to simplify installation and improve ergonomics
- EZ-STATUS® promotes faster response to status changes and reduces the risk of costly mistakes and accidents

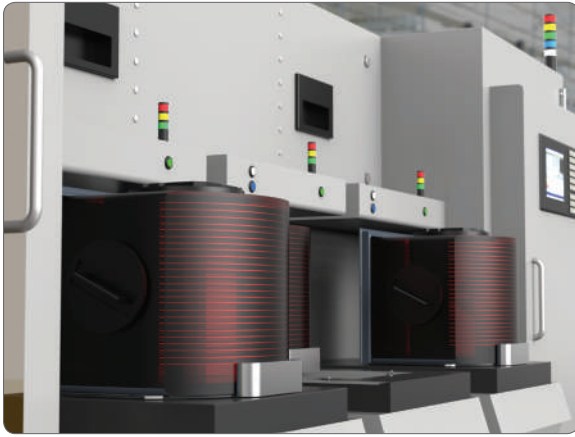
## Heavy-Diffuse WLS27

- Now available with heavy diffuse windows for reduced intensity and a more uniform light distribution



## WLS15 Dual Color

- Dual-color models with EZ-STATUS® combine illumination and indication in one light fixture



### Challenge

- Operators standing close to the machine need to be alerted to changes in status
- Larger tower lights with a brighter light output can strain the eyes if a worker stands in close proximity for long periods of time

### Solution

- **TL30** tower lights display machine status with a clearly visible but comfortable light output that workers can be nearby for extended periods of time
- The slim 30 mm diameter is suitable for a wide range of machines, including equipment where space is limited
- Uniform indicator segments appear gray when off, eliminating false indication from ambient light



### Challenge

- Visibility is critical for equipment inspection and maintenance on a skid
- The presence of oil or gas qualifies the area as Class I Division 2

### Solution

- **HLS27** provides bright light so personnel can verify equipment status
- The slim design easily fits under the roof without obstructing the work area or view
- Dimming options give the operator control of intensity and provide energy savings
- The HLS27 also fits cleanly in the control cabinet
- Color options are available for integrated, location specific status indication



### Challenge

- Truck drivers need to know when to advance through the wash and when to wait or proceed with caution
- Most stoplights cannot withstand the harsh environment inside the wash and therefore cannot be mounted close enough to the process for drivers to easily see status changes. In addition, traditional stoplights are often not bright enough to see well in outdoor settings.

### Solution

- **WLS27** segmented strip lights provide reliable performance in harsh environments
- Bright light output and long length of the strip light generate highly visible indication that can be easily identified from a distance or at an angle
- WLS27 segmented models can display multiple conditions simultaneously like a standard tower light
- Cascadable for increased visibility with no additional wiring





### Challenge

- Hard guards around robotic work cells can block overhead lighting, resulting in a dimly lit area
- Poor lighting makes maintenance more challenging to complete quickly and effectively, while harsh lighting can create an uncomfortable work environment for staff

### Solution

- **WLB72** strip lights brightly illuminate the area so staff can easily monitor and maintain equipment
- The diffuse window reduces glare and hotspots, which can cause eye strain
- Adding light where needed is a more budget-friendly solution than adding more high bay fixtures
- The energy-efficient LED lights provide years of maintenance-free operation and a low total cost of ownership (TCO)

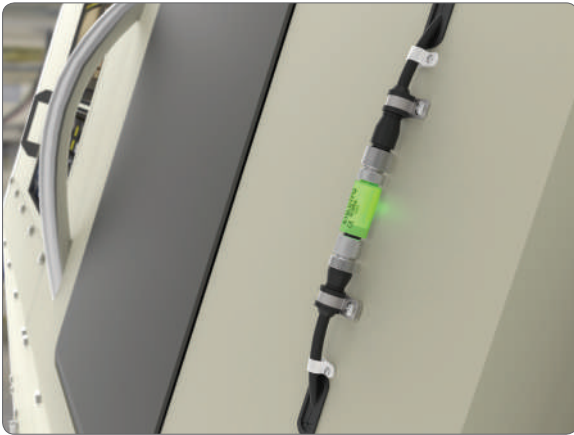


### Challenge

- Work cycles can vary in length, and periodically an operator will need to enter the robotic cell during a work cycle
- Shutting the robot off with an emergency stop button will bring operations to a sudden halt and can damage the robot as well as the material being worked upon

### Solution

- **OS80** Operator Switch is easy-to-install in any location
- Easily actuated by a gloved or bare hand without worry of false actuation
- The tactile operation and bright illuminated base indicator provides unmistakable mechanical and visual feedback when the OS80 has been actuated

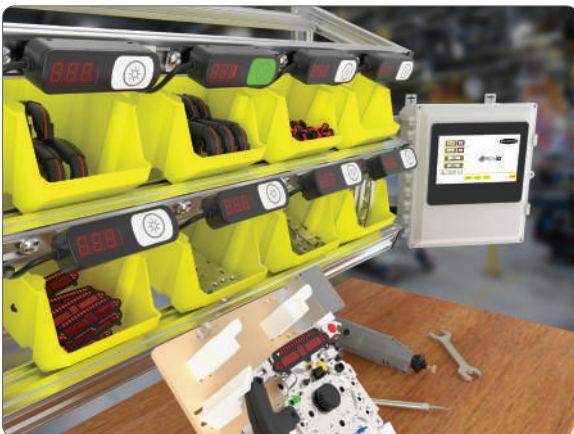


### Challenge

- Operators looking at the sensors were unable to see when the output was active
- Difficult to troubleshoot the issues that arose on the assembly line, causing costly downtime

### Solution

- **S15L** In-Line Sensor Status Indicators can be mounted in-line with a sensor for 360 degree-visibility of power and status
- 4 LEDs contained in the device produce two colors, green and yellow, to identify power and output status
- Low-profile design makes it ideal for bright indication in tight spaces



### Challenge

- Manufacturers want to find ways to streamline productivity on their assembly lines
- Operators frequently grab from the wrong location and install incorrect components

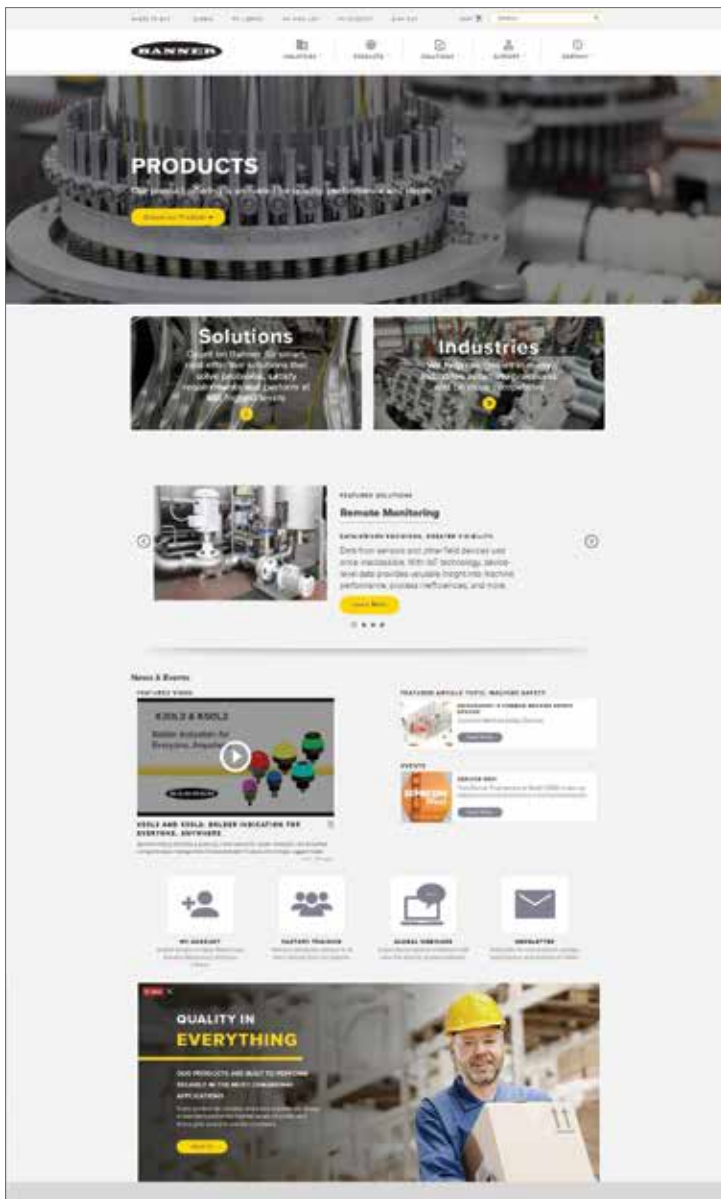
### Solution:

- **Pick-to-Light Solutions Kit** is an enclosure with a DXM Controller on the inside and an HMI on the outside that is ready to connect to power and PTL110 devices
- The built-in configurations decrease installation costs, improve pick sequences, and ensure flexible pick functionality
- Pick-to-Light devices and systems help manufacturers reduce the risk of error in the assembly process, boosting product quality and reducing cost



# More Information Online

You also have access to more detailed information such as engineering drawings, complete specifications, installation instructions, product configurators and product videos.



T18 and T30 T-Style Indicators



T8L T-Style Indicators



K80 Call Light Battery Powered Flashing Indicators



K80L Flat-Mount Domed Indicators



M18 Metal Barrel Indicators



TL30F Linear Segmented Indicators



LTB Optical Touch Buttons



# How to Reach Us

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