

SAFETY LIGHT SCREEN SELECTION

Type	Model		Catalog Page	Safety Category	Resolution	Supply Voltage	Maximum Range	
EZ-SCREEN®	Standard Systems		Page 20	4	14 & 30 mm	24V dc	18 m	
	Cascade Systems				14 & 30 mm		18 m	
	Grid & Point Systems				300 to 584 mm (beam spacing)		70 m	
PICO-GUARD™	Grid Systems		Page 36	4	300 to 584 mm (beam spacing)	24V dc	31 m	
	Point Systems				—			
MICRO-SCREEN®	Emitters & Receivers		Page 42	4	19 mm	Supplied by controller	9 m	
	Standard Series				32 mm			
	V-Series							
	Controllers				N/A	24V dc, 115 or 230V ac	N/A	
	Metal Box Controllers							
	DIN Module Controllers					24V dc		
MINI-SCREEN®	Emitters & Receivers		Page 58	4	19 & 25 mm	Supplied by controller	18 m	
	Standard Series				38 mm			
	Heavy-Duty Series							
	Controllers				N/A	24V dc, 115V ac or 230V ac	N/A	
	Metal Box Controllers							
	DIN Module Controllers					24V dc		
EZ-SCREEN® Type 2	Type 2 Systems		Page 78	2	30 mm	24V dc	15 m	

NC = Normally Closed Relay, NO = Normally Open Relay

	Safety Output	Blanking	Muting Option	Output Response Time	Housing Material	Environmental Rating
	2 PNP OSSD (Trip /Latch Selectable)	Reduced Resolution (floating) 2-beam & Fixed	Optional Accessory (see page 123)	9 to 56 ms	Aluminum housing with yellow polyester powder finish or nickel-plated ESD	IEC IP65
				11 to 56 ms		
		—		≤ 24 ms		
	2 PNP OSSD (Trip /Latch Selectable) See page 108 for controller	—	Optional Accessory (see page 123)	13 ms	Black aluminum housing, tempered glass window	IEC IP65
				See page 108 for controller	12 mm threaded barrel: Black polycarbonate plastic housing 30 mm threaded barrel: Stainless steel housing, glass window.	IEC IP67
	—	Reduced Resolution (floating) 1- or 2-beam & Fixed	—	< 38 ms (< 48 ms for muting)	Aluminum housing with yellow polyester powder finish or nickel-plated ESD	IEC IP65
	2 NO (Trip or Latch)		Yes		Welded steel box with black polyester powder paint finish	IEC IP64
	2 or 4 NO (Trip or Latch)		Optional Accessory (see page 123)		Gray polycarbonate	IEC IP20
	—	Reduced Resolution (floating) 1- or 2-beam & Fixed	—	< 48 to < 72 ms (< 58 to < 82 ms for muting)	Aluminum housing with black anodized or yellow polyester painted finish	IEC IP65
	2 NO (Trip or Latch)		Yes		Welded steel box with black polyester powder paint finish	IEC IP64
			Optional Accessory (see page 123)		Gray polycarbonate	IEC IP20
	2 PNP OSSD (Trip or Latch)	—	Optional Accessory (see page 123)	11 to 25 ms	Aluminum housing with yellow polyester powder finish	IEC IP65

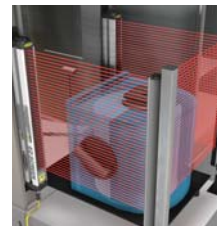
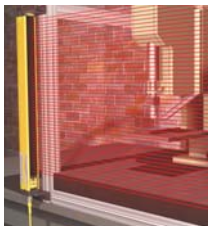
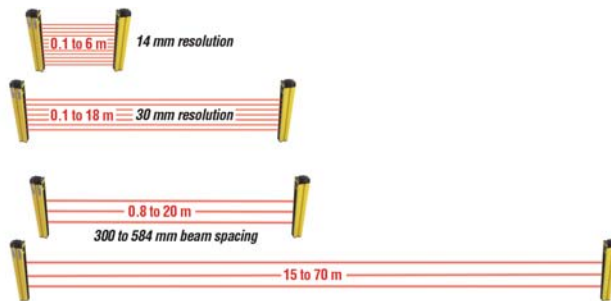
EZ-SCREEN®

Safety Light Screens

- Simple, two-piece integrated system has no control box.
- High-resolution 14 and 30 mm EZ-SCREEN® point-of-operation systems provide finger, hand and ankle detection.
- EZ-SCREEN Point and Grid systems allow one-, two-, three- or four-beam perimeter and access guarding.
- Superior optical design and finely focused $\pm 2.5^\circ$ beam make systems extremely easy to align and maintain.
- Status indicators and diagnostics show when alignment is complete and if there are problems with the installation.
- Redundant microprocessor-controlled, self-checking design exceeds control reliability requirements and is certified per CE (Type 4/Category 4) and cULus (NIPF, UL 61496, UL 1998).
- Unique cascading models (patent-pending) allow up to four systems of any length and resolution to be wired together to form a single safety device.
- Systems have ranges up to 70 m, with power and range for all types of applications including long-range perimeter guarding.



A complete family of machine guarding products.



Point of operation.

- Finger, hand or ankle detection at the point of operation.
- Use 14 or 30 mm EZ-SCREEN.

Area.

- Mount horizontally to eliminate safety mats and area scanners.
- Manually reset Latch output when area is clear.

Perimeter.

- Guard multiple sides of a dangerous area up to 70 m long.
- Expand guarding with optional corner mirrors and mounting stands.

Long-range single sided.

- EZ-SCREEN Grid systems provide 2, 3 or 4 beams.
- Beam spacing is from 300 to 584 mm.

Single point access.

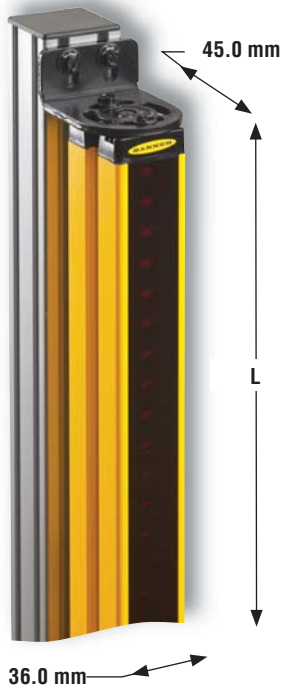
- Use with angled mirrors to simulate a 2-beam system.
- Use multiple units for custom beam patterns.

ESD applications.

- Dissipate electrostatic discharges.
- Ideal for microelectronic applications.

EZ-SCREEN® Systems

- 7-segment diagnostic display
- Blocked beam zone indicators
- System status and system reset status
- Integral or pigtail Euro-style QD connection
- Durable aluminum housing to resist twisting
- Metal end caps for added durability
- User configurable trip or latch outputs and Scan Code 1 or 2
- Fixed or 2-beam reduced resolution (floating) blanking
- EDM input and optional TEST** function



EZ-SCREEN Systems

Full View of Available Finishes



Yellow Painted Aluminum

Nickel-Plated ESD

EZ-SCREEN® Systems, 14 mm Resolution

Models*	Resolution	Range	Defined Area	Housing Length (L)	Supply Voltage	Safety Outputs	Response Time	Connec-tion**	Data Sheet
SLSP14-150Q88† SLSE14-150Q8 SLSR14-150Q8	 14 mm Resolution	0.1 to 6 m	150 mm	262 mm	24V dc	2 PNP OSSD	≤ 11 ms	8-pin Euro QD	112852
SLSP14-300Q88† SLSE14-300Q8 SLSR14-300Q8			300 mm	372 mm			≤ 15 ms		
SLSP14-450Q88† SLSE14-450Q8 SLSR14-450Q8			450 mm	522 mm			≤ 19 ms		
SLSP14-600Q88† SLSE14-600Q8 SLSR14-600Q8			600 mm	671 mm			≤ 23 ms		
SLSP14-750Q88† SLSE14-750Q8 SLSR14-750Q8			750 mm	821 mm			≤ 27 ms		
SLSP14-900Q88† SLSE14-900Q8 SLSR14-900Q8			900 mm	971 mm			≤ 32 ms		
SLSP14-1050Q88† SLSE14-1050Q8 SLSR14-1050Q8			1050 mm	1120 mm			≤ 36 ms		

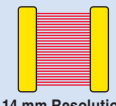


* Nickel-plated emitters and receivers used for ESD safe applications are available by adding "N" in the model number (example, **SLSE14-150NQ8**).

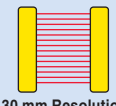
** For an emitter with TEST function, replace Q8 with Q5 on emitter model numbers (example, **SLSE14-150Q5**) and Q88 with Q85 on pair model numbers (example, **SLSP14-150Q85**). For a 300 mm Euro pigtail QD, replace "Q" with "P" in models numbers (example, **SLSP14-150P88**). A model with a QD requires a mating cable (see page 176).

† A pair includes an emitter and receiver (example, **SLSP14-150Q88**). Emitters (example, **SLSE14-150Q8**) and receivers (example, **SLSR14-150Q8**) are also sold separately.

EZ-SCREEN® Systems, 14 mm Resolution (cont'd)

Models*	Resolution	Range	Defined Area	Housing Length (L)	Supply Voltage	Safety Outputs	Response Time	Connec-tion**	Data Sheet
SLSP14-1200Q88† SLSE14-1200Q8 SLSR14-1200Q8	 14 mm Resolution	0.1 to 6 m	1200 mm	1270 mm	24V dc	2 PNP OSSD	≤ 40 ms	8-pin Euro QD	112852
SLSP14-1350Q88† SLSE14-1350Q8 SLSR14-1350Q8			1350 mm	1420 mm			≤ 43 ms		
SLSP14-1500Q88† SLSE14-1500Q8 SLSR14-1500Q8			1500 mm	1569 mm			≤ 48 ms		
SLSP14-1650Q88† SLSE14-1650Q8 SLSR14-1650Q8			1650 mm	1719 mm			≤ 52 ms		
SLSP14-1800Q88† SLSE14-1800Q8 SLSR14-1800Q8			1800 mm	1869 mm			≤ 56 ms		

EZ-SCREEN® Systems, 30 mm Resolution

Models*	Resolution	Range	Defined Area	Housing Length (L)	Supply Voltage	Safety Outputs	Response Time	Connec-tion**	Data Sheet
SLSP30-150Q88† SLSE30-150Q8 SLSR30-150Q8	 30 mm Resolution	0.1 to 18 m	150 mm	262 mm	24V dc	2 PNP OSSD	≤ 9 ms	8-pin Euro QD	112852
SLSP30-300Q88† SLSE30-300Q8 SLSR30-300Q8			300 mm	372 mm			≤ 11 ms		
SLSP30-450Q88† SLSE30-450Q8 SLSR30-450Q8			450 mm	522 mm			≤ 13 ms		
SLSP30-600Q88† SLSE30-600Q8 SLSR30-600Q8			600 mm	671 mm			≤ 15 ms		
SLSP30-750Q88† SLSE30-750Q8 SLSR30-750Q8			750 mm	821 mm			≤ 17 ms		



14 mm Resolution



30 mm Resolution

* Nickel-plated emitters and receivers used for ESD safe applications are available by adding "N" in the model number (example, **SLSE14-1200NQ8**).

** For an emitter with TEST function, replace Q8 with Q5 on emitter model numbers (example, **SLSE14-1200Q5**) and Q88 with Q85 on pair model numbers (example, **SLSP14-1200Q85**). For a 300 mm Euro pigtail QD, replace "Q" with "P" in models numbers (example, **SLSP14-1200P88**). A model with a QD requires a mating cable (see page 176).

† A pair includes an emitter and receiver (example, **SLSP14-1200Q88**). Emitters (example, **SLSE14-1200Q8**) and receivers (example, **SLSR14-1200Q8**) are also sold separately.

EZ-SCREEN® Systems, 30 mm Resolution (cont'd)

Models*	Resolution	Range	Defined Area	Housing Length (L)	Supply Voltage	Safety Outputs	Response Time	Connec- tion**	Data Sheet
SLSP30-900Q88† SLSE30-900Q8 SLSR30-900Q8	 30 mm Resolution	0.1 to 18 m	900 mm	971 mm	24V dc	2 PNP OSSD	≤ 19 ms	8-pin Euro QD	112852
SLSP30-1050Q88† SLSE30-1050Q8 SLSR30-1050Q8			1050 mm	1120 mm			≤ 21 ms		
SLSP30-1200Q88† SLSE30-1200Q8 SLSR30-1200Q8			1200 mm	1270 mm			≤ 23 ms		
SLSP30-1350Q88† SLSE30-1350Q8 SLSR30-1350Q8			1350 mm	1420 mm			≤ 25 ms		
SLSP30-1500Q88† SLSE30-1500Q8 SLSR30-1500Q8			1500 mm	1569 mm			≤ 27 ms		
SLSP30-1650Q88† SLSE30-1650Q8 SLSR30-1650Q8			1650 mm	1719 mm			≤ 30 ms		
SLSP30-1800Q88† SLSE30-1800Q8 SLSR30-1800Q8			1800 mm	1869 mm			≤ 32 ms		



* Nickel-plated emitters and receivers used for ESD safe applications are available by adding "N" in the model number (example, **SLSE30-900NQ8**).

** For an emitter with TEST function, replace Q8 with Q5 on emitter model numbers (example, **SLSE30-900Q5**) and Q88 with Q85 on pair model numbers (example, **SLSP30-900Q85**). For a 300 mm Euro pigtail QD, replace "Q" with "P" in models numbers (example, **SLSP30-900P88**). A model with a QD requires a mating cable (see page 176).

† A pair includes an emitter and receiver (example, **SLSP30-900Q88**). Emitters (example, **SLSE30-900Q8**) and receivers (example, **SLSR14-900Q8**) are also sold separately.

EZ-SCREEN® 14 & 30 mm Resolution Specifications

Supply Voltage at the Device*	24V dc $\pm 15\%$ (SELV), $\pm 10\%$ max. ripple
Supply Current	Emitter: 100 mA max. Receiver: 275 mA max., exclusive of OSSD1 and OSSD2 loads (up to an additional 0.5A each)
Response Time	9 to 56 miliseconds Cascade Safety Stop Interface (CSSI): 40 milliseconds max.
Remote Test Input (Optional – available only on model SLSE...Q5 emitters)	Test Mode is activated either by applying a low signal (less than 3V dc) to emitter TEST #1 terminal for a minimum of 50 milliseconds, or by opening a switch connected between TEST #1 and TEST #2 for a minimum of 50 milliseconds. Beam scanning stops to simulate a blocked condition. A high signal at TEST #1 deactivates Test Mode. (See p/n 112852 for more information.) High signal: 10 to 30V dc Low signal: 0 to 3V dc Input current: 35 mA inrush, 10 mA max.
Wavelength of Emitter Elements	Infrared LEDs, 950 nm at peak emission
EDM Input	+24V dc signals from external device contacts can be monitored (one-channel, two-channel or no monitoring) via EDM1 and EDM2 terminals in the receiver. Monitored devices must respond within 200 milliseconds of an output change. High signal: 10 to 30V dc at 30 mA typical Low signal: 0 to 3V dc Dropout time: 200 milliseconds max.
Reset Input	The Reset input must be high for 0.25 to 2 seconds and then low to reset the receiver. High signal: 10 to 30V dc at 30 mA typical Low signal: 0 to 3V dc Closed switch time: 0.25 to 2 seconds
Safety Outputs	Two redundant solid-state 24V dc, 0.5 A max. sourcing OSSD (Output Signal Switching Device) safety outputs. (Use optional interface modules for ac or larger dc loads.) Capable of the Banner "Safety Handshake". ON-State voltage: $\geq V_{in}-1.5V$ dc OFF-State voltage: 1.2V dc max. (0-1.2V dc) Max. load capacitance: 1.0 μF Max. load inductance: 10 H Leakage current: 0.50 mA maximum Cable resistance: 10 Ω maximum OSSD test pulse width: 100 to 300 microseconds OSSD test pulse period: 5 to 27 milliseconds (varies with number of beams) Switching current: 0-0.5 A
Controls and Adjustments	Emitter: Scan Code selection: 2-position switch (code 1 or 2). Factory default position is code 1. Receiver: Scan Code selection: 2-position switch (code 1 or 2). Factory default position is code 1. Trip/Latch Output selection: Redundant switches. Factory default position is T (Trip). EDM/MPCE monitor selection: 2-position switch selects between 1- or 2-channel monitoring. Factory default position is 2. Reduced Resolution (2-beam Floating Blanking): Redundant switches to enable. Factory default is OFF.
Short Circuit Protection	All inputs and outputs are protected from short circuits to +24V dc or dc common*
Electrical Safety Class (IEC 61140: 1997)	III
Safety Rating	Type 4 per IEC 61496-1, -2; Category 4 per ISO 13849-1 (EN 954-1)
Operating Range	14 mm models: 0.1 m to 6 m 30 mm models: 0.1 m to 18 m Range decreases with use of mirrors and/or lens shields: Lens shields – approximately 10% less range per shield. Glass-surface mirrors – approximately 8% less range per mirror. See Accessory section for more information on a specific mirror, page 204.
Ambient Light Immunity	> 10,000 lux at 5° angle of incidence
Effective Aperture Angle (EAA)	Meets Type 4 requirements per IEC 61496-2, $\pm 2.5^\circ$ @ 3 m

*The external voltage supply must be capable of buffering brief mains interruptions of 20 milliseconds, as specified in IEC/EN 60204-1.

EZ-SCREEN® 14 & 30 mm Resolution Specifications (cont'd)

Enclosure	Materials: Extruded aluminum housing with yellow polyester powder or nickel-plated finish and well-sealed, rugged die-cast zinc end caps, acrylic lens cover, copolyester access cover Rating: IEC IP65
Operating Conditions	Temperature: 0° to +55° C Relative humidity: 95% (non-condensing)
Status Indicators	Emitter: One Bi-color (Red/Green) Status Indicator – indicates operating mode, Lockout or power OFF condition 7-segment Diagnostic Indicator (1 digit) – indicates proper operation, scan code or error code Receiver: Yellow Reset Indicator – indicates whether system is ready for operation or requires a reset Bi-Color (Red/Green) Status Indicator – indicates general system and output status Bi-Color (Red/Green) Zone Status Indicators – indicates condition (clear or blocked beam) of a defined group of beams 7-Segment Diagnostic Indicator (3-digit) – indicates proper operation, scan code or error code, total number of blocked beams
Mounting Hardware	Emitter and receiver each are supplied with a pair of swivel end-mounting brackets. Models longer than 900 mm also include a swivel center-mount bracket. Mounting brackets are 8-gauge cold-rolled steel, black zinc finish.
Shock and Vibration	EZ-SCREEN systems have passed vibration and shock tests according to IEC 61496-1. This includes vibration (10 cycles) of 10-55 Hz at 0.35 mm single amplitude (0.70 mm peak-to-peak) and shock of 10 g for 16 milliseconds (6,000 cycles).
Certifications	For a list of certifications see page 236.
Wiring Diagrams	WD001, WD002, WD003, WD004, WD009, WD010, WD011, WD012, WD013, WD014, WD015, WD016 (pp. 246-254)