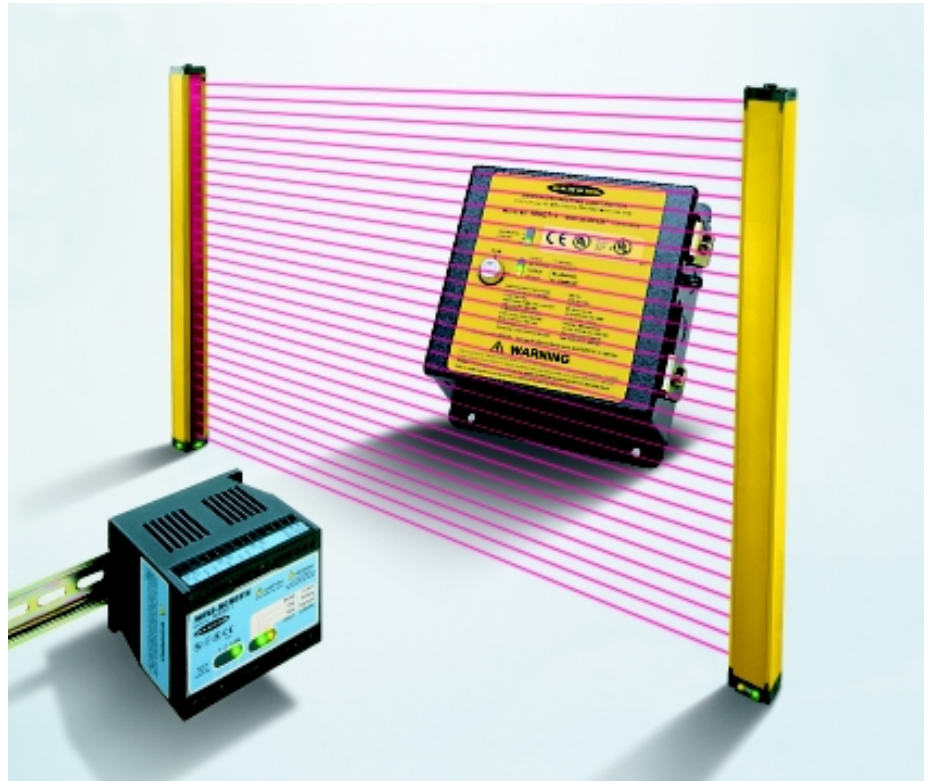


MINI-SCREEN™

Machine safety light curtain



- Safety light curtain type 4 according to IEC1496-1, -2, EN 50100-1, -2 and EN61496 -1, -2
- 10 cm to 120 cm height
- 9 m emitter/receiver range
- 4 x 4 cm emitter/receiver arrays
- Highly immune to EMI, RFI, ambient light, weld flash and strobe light
- Self-checking every 20 ms
- FMEA tested to ensure control reliability



The Banner MINI-SCREEN is a micro-processor controlled opposed mode optoelectronic "curtain of light". It is designed for use as a point-of-operation guarding device, and is especially suited to smaller production machinery.

Banner's microprocessor-based circuit establishes a higher level of control reliability in machine guard design. The MINI-SCREEN System uses the design concept of "diverse redundancy", in which two microprocessors of different design, running from two different instruction sets, constantly check all system components, including each other. Banner MINI-SCREEN Systems are extensively FMEA (Failure Mode and Effects Analysis) tested to establish an extremely high degree of confidence that no system component will ever, even if it does fail, cause a *failure to danger*.

In typical operation, if any part of an operator's body enters the guarded area of the machine, the output relays of the MINI-SCREEN System will open. The contacts of the output relays are connected to the guarded machine's primary control elements (MPCEs) which immediately stop the motion of the guarded machine. The output relays have forced-guided contacts for enhanced control reliability.

The Banner MINI-SCREEN is a modular machine guard system. Each system is made up of an MSE Series emitter unit, an MSR Series receiver unit, and a control box. The control box can be either a DIN rail mountable box or a ruggedised wall mountable box in welded steel. Emitter units consist of a row of synchronized modulated infrared LEDs in a compact metal housing. Receiver units consist of a corresponding row of synchronized phototransistors. Emitters and receivers are available in 12 lengths from 10 cm to 120 cm.

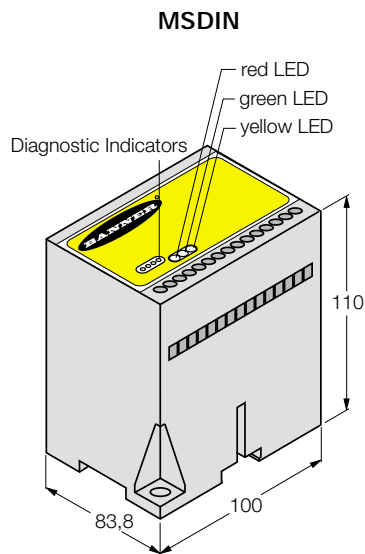
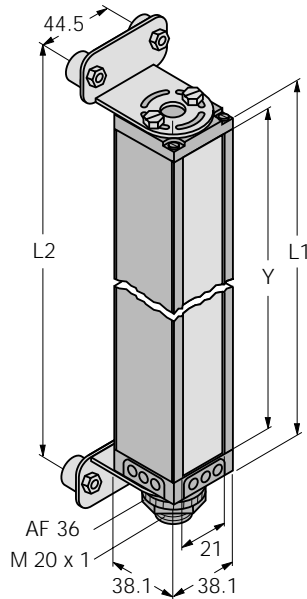
Control boxes and receivers have LED indicators for system operating status and alignment. Each receiver has three sets of status LEDs (front and both sides) for high visibility. Emitters have POWER ON indicators. Control boxes can be easily configured for floating blanking and automatic power-up.

The components of a MINI-SCREEN system may be purchased separately, or they may be purchased bundled together in kit form. A kit contains one controlbox, one emitter and one receiver unit and 2 shielded cables.

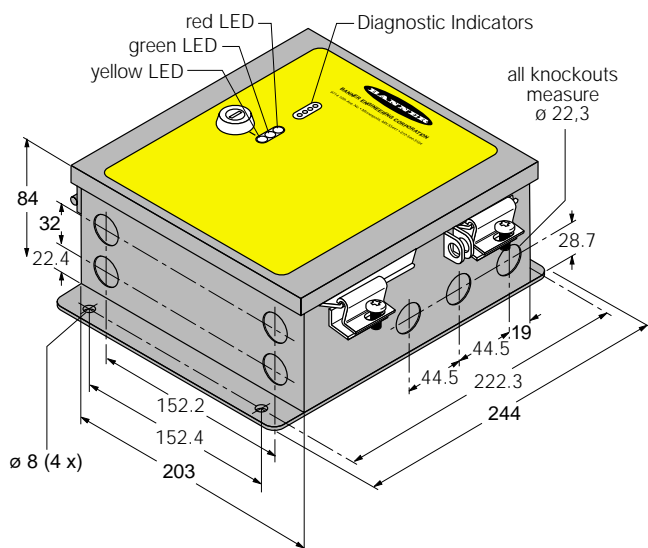
The emitter and the receiver unit are delivered with swivel mounting brackets for easy alignment and anti-vibration mounts. Optional accessories include corner mirrors, stands and lens shields of different length.

MINI-SCREEN™ Machine safety light curtain

Dimensions [mm]



MSCA-1, MSCB-1, MSCT-1



Wave length

IR 880 nm

Safety class

4

Supply

MSCA-1 115 VAC $\pm 15\%$ (50/60 Hz), 55 VA
MSCB-1 230 VAC $\pm 15\%$ (50/60 Hz), 55 VA
MSCT-1 & MSDINT-1 24 VDC
 Ripple V_{pp} $\leq 10\%$
 Current ≤ 1.5 A

Resolution

Object Detection Capability 19 mm
 44 mm (floating blanking)

Range

Emitter/receiver separation 0.15 – 9 m

Response time

Emitter/receiver ≤ 40 cm < 48 ms
 Emitter/receiver ≤ 80 cm < 60 ms
 Emitter/receiver ≤ 120 cm < 72 ms

Self checking interval 20 ms

Output

FSD1, FSD2, SSD

Type force guide contact relays
 Rating 250 VAC, 4 A (resistive load)

Auxiliary monitor contact

Type reed relay
 Rating 125 VAC, 500 mA (10 VA max.)

Material

Emitter & Receivers

Housing aluminum, yellow painted finish
 Lens acrylic
 Protection class IP65

MSCA-1, MSCB-1, MSCT-1

Housing welded steel, black polyester finish
 Protection class IP64

MSDINT-1

Housing black polycarbonate
 Protection class IP20
 Removable wiring bloc

Accessories

(included with emitter and receiver)

Brackets (2) 2.3 mm steel
 Vibration mount (4)



Kit Part numbers

	<i>Defined area Y [mm]</i>	<i>Type with two 4.5 m cables</i>	<i>Ident number</i>	<i>Type with two 7.5 m cables</i>	<i>Ident number</i>	<i>Type with 4.5 + 7.5 m cables</i>	<i>Ident number</i>
MINI-SCREEN kits Ruggedised control box MSCA-1 115 VAC Yellow emitter & receiver	114	MSKA424YC1	3045601	MSKA424YC2	3045613	MSKA424YC3	3045625
	215	MSKA824YC1	3045602	MSKA824YC2	3045614	MSKA824YC3	3045626
	305	MSKA1224YC1	3045603	MSKA1224YC2	3045615	MSKA1224YC3	3045627
	406	MSKA1624YC1	3045604	MSKA1624YC2	3045616	MSKA1624YC3	3045628
	508	MSKA2024YC1	3045605	MSKA2024YC2	3045617	MSKA2024YC3	3045629
	610	MSKA2424YC1	3045606	MSKA2424YC2	3045618	MSKA2424YC3	3045630
	711	MSKA2824YC1	3045607	MSKA2824YC2	3045619	MSKA2824YC3	3045631
	813	MSKA3224YC1	3045608	MSKA3224YC2	3045620	MSKA3224YC3	3045632
	914	MSKA3624YC1	3045609	MSKA3624YC2	3045621	MSKA3624YC3	3045633
	1016	MSKA4024YC1	3045610	MSKA4024YC2	3045622	MSKA4024YC3	3045634
	1118	MSKA4424YC1	3045611	MSKA4424YC2	3045623	MSKA4424YC3	3045635
1219	MSKA4824YC1	3045612	MSKA4824YC2	3045624	MSKA4824YC3	3045636	
MINI-SCREEN kits Ruggedised control box MSCB-1 230 VAC Yellow emitter & receiver	114	MSKB424YC1	3045637	MSKB424YC2	3045649	MSKB424YC3	3045661
	215	MSKB824YC1	3045638	MSKB824YC2	3045650	MSKB824YC3	3045662
	305	MSKB1224YC1	3045639	MSKB1224YC2	3045651	MSKB1224YC3	3045663
	406	MSKB1624YC1	3045640	MSKB1624YC2	3045652	MSKB1624YC3	3045664
	508	MSKB2024YC1	3045641	MSKB2024YC2	3045653	MSKB2024YC3	3045665
	610	MSKB2424YC1	3045642	MSKB2424YC2	3045654	MSKB2424YC3	3045666
	711	MSKB2824YC1	3045643	MSKB2824YC2	3045655	MSKB2824YC3	3045667
	813	MSKB3224YC1	3045644	MSKB3224YC2	3045656	MSKB3224YC3	3045668
	914	MSKB3624YC1	3045645	MSKB3624YC2	3045657	MSKB3624YC3	3045669
	1016	MSKB4024YC1	3045646	MSKB4024YC2	3045658	MSKB4024YC3	3045670
	1118	MSKB4424YC1	3045647	MSKB4424YC2	3045659	MSKB4424YC3	3045671
1219	MSKB4824YC1	3045648	MSKB4824YC2	3045660	MSKB4824YC3	3045672	
MINI-SCREEN kits Ruggedised control box MSCT-1 24 VDC Yellow emitter & receiver	114	MSKT424C1Y	3045800	MSKT424C2Y	3045812	MSKT424C3Y	3045824
	215	MSKT824C1Y	3045801	MSKT824C2Y	3045813	MSKT824C3Y	3045825
	305	MSKT1224C1Y	3045802	MSKT1224C2Y	3045814	MSKT1224C3Y	3045826
	406	MSKT1624C1Y	3045803	MSKT1624C2Y	3045815	MSKT1624C3Y	3045827
	508	MSKT2024C1Y	3045804	MSKT2024C2Y	3045816	MSKT2024C3Y	3045828
	610	MSKT2424C1Y	3045805	MSKT2424C2Y	3045817	MSKT2424C3Y	3045829
	711	MSKT2824C1Y	3045806	MSKT2824C2Y	3045818	MSKT2824C3Y	3045830
	813	MSKT3224C1Y	3045807	MSKT3224C2Y	3045819	MSKT3224C3Y	3045831
	914	MSKT3624C1Y	3045808	MSKT3624C2Y	3045820	MSKT3624C3Y	3045832
	1016	MSKT4024C1Y	3045809	MSKT4024C2Y	3045821	MSKT4024C3Y	3045833
	1118	MSKT4424C1Y	3045810	MSKT4424C2Y	3045822	MSKT4424C3Y	3045834
1219	MSKT4824C1Y	3045811	MSKT4824C2Y	3045823	MSKT4824C3Y	3045835	
MINI-SCREEN kits DIN control box MSDINT-1 24 VDC Yellow emitter & receiver	114	MSDKT424C1Y	3046044	MSDKT424C2Y	3046056	MSDKT424C3Y	3046068
	215	MSDKT824C1Y	3046045	MSDKT824C2Y	3046057	MSDKT824C3Y	3046069
	305	MSDKT1224C1Y	3046046	MSDKT1224C2Y	3046058	MSDKT1224C3Y	3046070
	406	MSDKT1624C1Y	3046047	MSDKT1624C2Y	3046059	MSDKT1624C3Y	3046071
	508	MSDKT2024C1Y	3046048	MSDKT2024C2Y	3046060	MSDKT2024C3Y	3046072
	610	MSDKT2424C1Y	3046049	MSDKT2424C2Y	3046061	MSDKT2424C3Y	3046073
	711	MSDKT2824C1Y	3046050	MSDKT2824C2Y	3046062	MSDKT2824C3Y	3046074
	813	MSDKT3224C1Y	3046051	MSDKT3224C2Y	3046063	MSDKT3224C3Y	3046075
	914	MSDKT3624C1Y	3046052	MSDKT3624C2Y	3046064	MSDKT3624C3Y	3046076
	1016	MSDKT4024C1Y	3046053	MSDKT4024C2Y	3046065	MSDKT4024C3Y	3046077
	1118	MSDKT4424C1Y	3046054	MSDKT4424C2Y	3046066	MSDKT4424C3Y	3046078
1219	MSDKT4824C1Y	3046055	MSDKT4824C2Y	3046067	MSDKT4824C3Y	3046079	

All kits include two test pieces (19 and 44 mm)

MINI-SCREEN™

Machine safety light curtain

Separate Component Part Numbers

	Defined area Y [mm]	Number of beams	Housing length L1 [mm]	Type	Ident-Nr.	Type	Ident-Nr.
MINI-SCREEN emitters & receivers	114	8	153	MSE424Y emitter	3047650	MSR424Y receiver	3047651
	215	16	254	MSE824Y emitter	3047652	MSR824Y receiver	3047653
	305	24	356	MSE1224Y emitter	3047654	MSR1224Y receiver	3047655
	406	32	457	MSE1624Y emitter	3047656	MSR1624Y receiver	3047657
	508	40	558	MSE2024Y emitter	3047658	MSR2024Y receiver	3047659
	610	48	659	MSE2424Y emitter	3047660	MSR2424Y receiver	3047661
	711	56	761	MSE2824Y emitter	3047662	MSR2824Y receiver	3047663
	813	64	862	MSE3224Y emitter	3047664	MSR3224Y receiver	3047665
	914	72	963	MSE3624Y emitter	3047666	MSR3624Y receiver	3047667
	1016	80	1064	MSE4024Y emitter	3047668	MSR4024Y receiver	3047669
	1118	88	1166	MSE4424Y emitter	3047670	MSR4424Y receiver	3047671
	1219	96	1267	MSE4824Y emitter	3047672	MSR4824Y receiver	3047673

Control boxes (one per system)

MSCA-1*	115 VAC	ruggedised	3037931
MSCB-1*	230 VAC	ruggedised	3037932
MSCT-1*	24 VDC	ruggedised	3043536
MSDINT-1*	24 VDC	DIN	3044469

Mounting Stands

(suitable for corner mirrors, emitters and receivers)

MSA-S24-1	610 mm	3043174
MSA-S42-1	1067 mm	3043175
MSA-S66-1	1676 mm	3043176

Cables

2 required per system; emitter and receiver cable lengths may not exceed 16 m each. All cables with straight *Conprox*® connector.

QDC-515C	4,5 m	3037442
QDC-525C	7,5 m	3037443
QDC-550C	16 m	3037498

Lens Shields

MSS4	102 mm	3044308
MSS8	203 mm	3044309
MSS12	305 mm	3044310
MSS16	406 mm	3044311
MSS20	508 mm	3044312
MSS24	610 mm	3044313
MSS28	711 mm	3044314
MSS32	813 mm	3044315
MSS36	914 mm	3044316
MSS40	1016 mm	3044317
MSS44	1118 mm	3044318
MSS48	1219 mm	3044319

Corner Mirrors

MSM4A	165 mm	3043162
MSM8A	267 mm	3043163
MSM12A	356 mm	3043164
MSM16A	457 mm	3043165
MSM20A	559 mm	3043166
MSM24A	660 mm	3043167
MSM28A	762 mm	3043168
MSM32A	864 mm	3043169
MSM36A	965 mm	3043170
MSM40A	1069 mm	3043171
MSM44A	1168 mm	3043172
MSM48A	1270 mm	3043173

Replacement parts

STP-2	specified test piece 19 mm	3039026
STP-3	specified test piece 44 mm	3039026

* These controller boxes have a trip function, but are also available with latch function. Please contact your Banner representative for additional information.