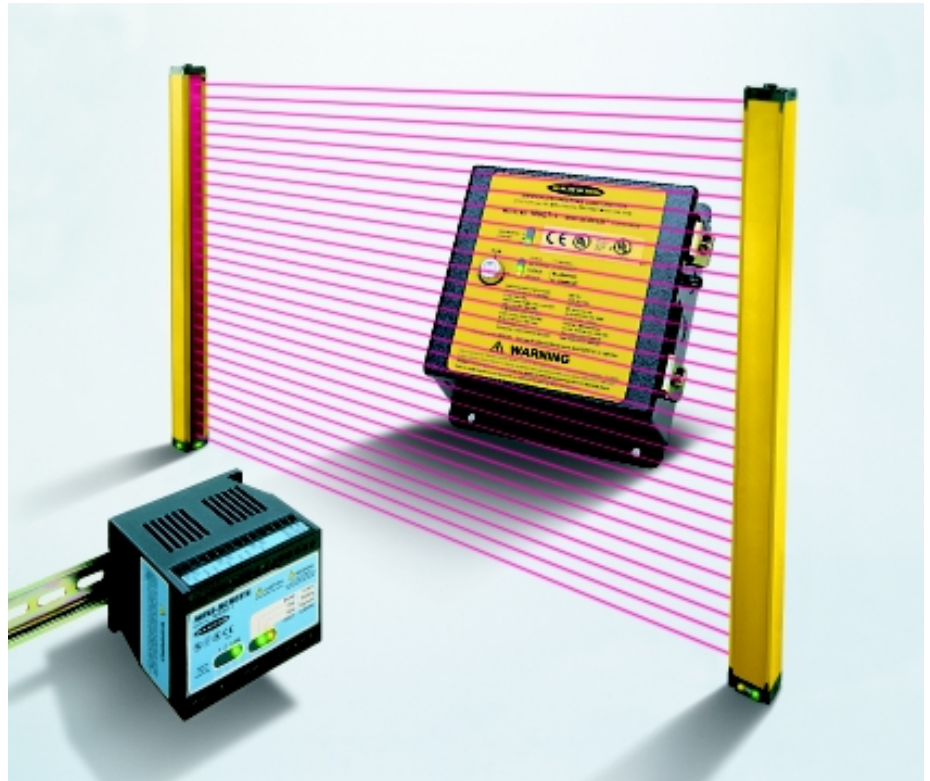


# MINI-SCREEN™

## 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.

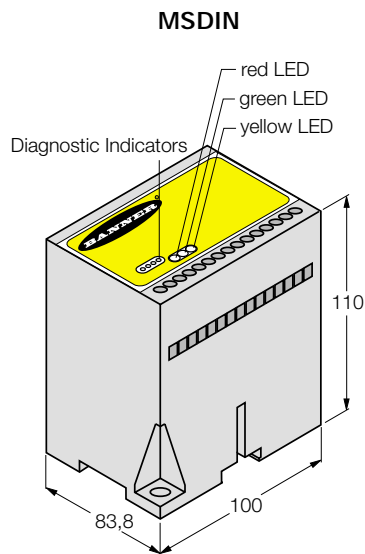
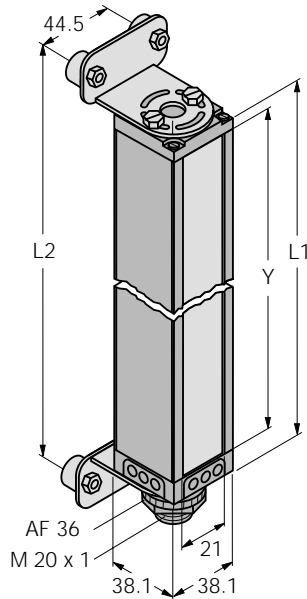
Control boxes and receivers have LED indicators for system operating status and alignment. Each receiver has three sets of status LEDs (front and both sides) for high visibility. Emitters have POWER ON indicators. Control boxes can be easily configured for floating blanking and automatic power-up.

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.

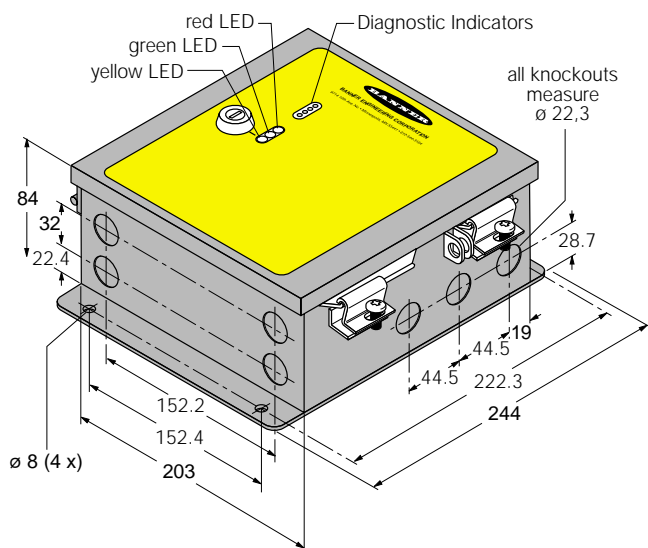
The emitter and the receiver unit are delivered with swivel mounting brackets for easy alignment and anti-vibration mounts. Optional accessories include corner mirrors, stands and lens shields of different length.

# 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  $\leq 1.5$  A

## Resolution

Object Detection Capability 19 mm  
 44 mm (floating blanking)

## Range

Emitter/receiver separation 0.15 – 9 m

## Response time

Emitter/receiver  $\leq 40$  cm < 48 ms  
 Emitter/receiver  $\leq 80$  cm < 60 ms  
 Emitter/receiver  $\leq 120$  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>
<b>MINI-SCREEN kits Ruggedised control box MSCA-1 115 VAC Yellow emitter &amp; receiver</b>	114	<b>MSKA424YC1</b>	3045601	<b>MSKA424YC2</b>	3045613	<b>MSKA424YC3</b>	3045625
	215	<b>MSKA824YC1</b>	3045602	<b>MSKA824YC2</b>	3045614	<b>MSKA824YC3</b>	3045626
	305	<b>MSKA1224YC1</b>	3045603	<b>MSKA1224YC2</b>	3045615	<b>MSKA1224YC3</b>	3045627
	406	<b>MSKA1624YC1</b>	3045604	<b>MSKA1624YC2</b>	3045616	<b>MSKA1624YC3</b>	3045628
	508	<b>MSKA2024YC1</b>	3045605	<b>MSKA2024YC2</b>	3045617	<b>MSKA2024YC3</b>	3045629
	610	<b>MSKA2424YC1</b>	3045606	<b>MSKA2424YC2</b>	3045618	<b>MSKA2424YC3</b>	3045630
	711	<b>MSKA2824YC1</b>	3045607	<b>MSKA2824YC2</b>	3045619	<b>MSKA2824YC3</b>	3045631
	813	<b>MSKA3224YC1</b>	3045608	<b>MSKA3224YC2</b>	3045620	<b>MSKA3224YC3</b>	3045632
	914	<b>MSKA3624YC1</b>	3045609	<b>MSKA3624YC2</b>	3045621	<b>MSKA3624YC3</b>	3045633
	1016	<b>MSKA4024YC1</b>	3045610	<b>MSKA4024YC2</b>	3045622	<b>MSKA4024YC3</b>	3045634
	1118	<b>MSKA4424YC1</b>	3045611	<b>MSKA4424YC2</b>	3045623	<b>MSKA4424YC3</b>	3045635
1219	<b>MSKA4824YC1</b>	3045612	<b>MSKA4824YC2</b>	3045624	<b>MSKA4824YC3</b>	3045636	
<b>MINI-SCREEN kits Ruggedised control box MSCB-1 230 VAC Yellow emitter &amp; receiver</b>	114	<b>MSKB424YC1</b>	3045637	<b>MSKB424YC2</b>	3045649	<b>MSKB424YC3</b>	3045661
	215	<b>MSKB824YC1</b>	3045638	<b>MSKB824YC2</b>	3045650	<b>MSKB824YC3</b>	3045662
	305	<b>MSKB1224YC1</b>	3045639	<b>MSKB1224YC2</b>	3045651	<b>MSKB1224YC3</b>	3045663
	406	<b>MSKB1624YC1</b>	3045640	<b>MSKB1624YC2</b>	3045652	<b>MSKB1624YC3</b>	3045664
	508	<b>MSKB2024YC1</b>	3045641	<b>MSKB2024YC2</b>	3045653	<b>MSKB2024YC3</b>	3045665
	610	<b>MSKB2424YC1</b>	3045642	<b>MSKB2424YC2</b>	3045654	<b>MSKB2424YC3</b>	3045666
	711	<b>MSKB2824YC1</b>	3045643	<b>MSKB2824YC2</b>	3045655	<b>MSKB2824YC3</b>	3045667
	813	<b>MSKB3224YC1</b>	3045644	<b>MSKB3224YC2</b>	3045656	<b>MSKB3224YC3</b>	3045668
	914	<b>MSKB3624YC1</b>	3045645	<b>MSKB3624YC2</b>	3045657	<b>MSKB3624YC3</b>	3045669
	1016	<b>MSKB4024YC1</b>	3045646	<b>MSKB4024YC2</b>	3045658	<b>MSKB4024YC3</b>	3045670
	1118	<b>MSKB4424YC1</b>	3045647	<b>MSKB4424YC2</b>	3045659	<b>MSKB4424YC3</b>	3045671
1219	<b>MSKB4824YC1</b>	3045648	<b>MSKB4824YC2</b>	3045660	<b>MSKB4824YC3</b>	3045672	
<b>MINI-SCREEN kits Ruggedised control box MSCT-1 24 VDC Yellow emitter &amp; receiver</b>	114	<b>MSKT424C1Y</b>	3045800	<b>MSKT424C2Y</b>	3045812	<b>MSKT424C3Y</b>	3045824
	215	<b>MSKT824C1Y</b>	3045801	<b>MSKT824C2Y</b>	3045813	<b>MSKT824C3Y</b>	3045825
	305	<b>MSKT1224C1Y</b>	3045802	<b>MSKT1224C2Y</b>	3045814	<b>MSKT1224C3Y</b>	3045826
	406	<b>MSKT1624C1Y</b>	3045803	<b>MSKT1624C2Y</b>	3045815	<b>MSKT1624C3Y</b>	3045827
	508	<b>MSKT2024C1Y</b>	3045804	<b>MSKT2024C2Y</b>	3045816	<b>MSKT2024C3Y</b>	3045828
	610	<b>MSKT2424C1Y</b>	3045805	<b>MSKT2424C2Y</b>	3045817	<b>MSKT2424C3Y</b>	3045829
	711	<b>MSKT2824C1Y</b>	3045806	<b>MSKT2824C2Y</b>	3045818	<b>MSKT2824C3Y</b>	3045830
	813	<b>MSKT3224C1Y</b>	3045807	<b>MSKT3224C2Y</b>	3045819	<b>MSKT3224C3Y</b>	3045831
	914	<b>MSKT3624C1Y</b>	3045808	<b>MSKT3624C2Y</b>	3045820	<b>MSKT3624C3Y</b>	3045832
	1016	<b>MSKT4024C1Y</b>	3045809	<b>MSKT4024C2Y</b>	3045821	<b>MSKT4024C3Y</b>	3045833
	1118	<b>MSKT4424C1Y</b>	3045810	<b>MSKT4424C2Y</b>	3045822	<b>MSKT4424C3Y</b>	3045834
1219	<b>MSKT4824C1Y</b>	3045811	<b>MSKT4824C2Y</b>	3045823	<b>MSKT4824C3Y</b>	3045835	
<b>MINI-SCREEN kits DIN control box MSDINT-1 24 VDC Yellow emitter &amp; receiver</b>	114	<b>MSDKT424C1Y</b>	3046044	<b>MSDKT424C2Y</b>	3046056	<b>MSDKT424C3Y</b>	3046068
	215	<b>MSDKT824C1Y</b>	3046045	<b>MSDKT824C2Y</b>	3046057	<b>MSDKT824C3Y</b>	3046069
	305	<b>MSDKT1224C1Y</b>	3046046	<b>MSDKT1224C2Y</b>	3046058	<b>MSDKT1224C3Y</b>	3046070
	406	<b>MSDKT1624C1Y</b>	3046047	<b>MSDKT1624C2Y</b>	3046059	<b>MSDKT1624C3Y</b>	3046071
	508	<b>MSDKT2024C1Y</b>	3046048	<b>MSDKT2024C2Y</b>	3046060	<b>MSDKT2024C3Y</b>	3046072
	610	<b>MSDKT2424C1Y</b>	3046049	<b>MSDKT2424C2Y</b>	3046061	<b>MSDKT2424C3Y</b>	3046073
	711	<b>MSDKT2824C1Y</b>	3046050	<b>MSDKT2824C2Y</b>	3046062	<b>MSDKT2824C3Y</b>	3046074
	813	<b>MSDKT3224C1Y</b>	3046051	<b>MSDKT3224C2Y</b>	3046063	<b>MSDKT3224C3Y</b>	3046075
	914	<b>MSDKT3624C1Y</b>	3046052	<b>MSDKT3624C2Y</b>	3046064	<b>MSDKT3624C3Y</b>	3046076
	1016	<b>MSDKT4024C1Y</b>	3046053	<b>MSDKT4024C2Y</b>	3046065	<b>MSDKT4024C3Y</b>	3046077
	1118	<b>MSDKT4424C1Y</b>	3046054	<b>MSDKT4424C2Y</b>	3046066	<b>MSDKT4424C3Y</b>	3046078
1219	<b>MSDKT4824C1Y</b>	3046055	<b>MSDKT4824C2Y</b>	3046067	<b>MSDKT4824C3Y</b>	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	<b>MSE424Y</b> emitter	3047650	<b>MSR424Y</b> receiver	3047651
	215	16	254	<b>MSE824Y</b> emitter	3047652	<b>MSR824Y</b> receiver	3047653
	305	24	356	<b>MSE1224Y</b> emitter	3047654	<b>MSR1224Y</b> receiver	3047655
	406	32	457	<b>MSE1624Y</b> emitter	3047656	<b>MSR1624Y</b> receiver	3047657
	508	40	558	<b>MSE2024Y</b> emitter	3047658	<b>MSR2024Y</b> receiver	3047659
	610	48	659	<b>MSE2424Y</b> emitter	3047660	<b>MSR2424Y</b> receiver	3047661
	711	56	761	<b>MSE2824Y</b> emitter	3047662	<b>MSR2824Y</b> receiver	3047663
	813	64	862	<b>MSE3224Y</b> emitter	3047664	<b>MSR3224Y</b> receiver	3047665
	914	72	963	<b>MSE3624Y</b> emitter	3047666	<b>MSR3624Y</b> receiver	3047667
	1016	80	1064	<b>MSE4024Y</b> emitter	3047668	<b>MSR4024Y</b> receiver	3047669
	1118	88	1166	<b>MSE4424Y</b> emitter	3047670	<b>MSR4424Y</b> receiver	3047671
	1219	96	1267	<b>MSE4824Y</b> emitter	3047672	<b>MSR4824Y</b> receiver	3047673

### Control boxes (one per system)

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

### Mounting Stands

(suitable for corner mirrors, emitters and receivers)

<b>MSA-S24-1</b>	610 mm	3043174
<b>MSA-S42-1</b>	1067 mm	3043175
<b>MSA-S66-1</b>	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.

<b>QDC-515C</b>	4,5 m	3037442
<b>QDC-525C</b>	7,5 m	3037443
<b>QDC-550C</b>	16 m	3037498

### Lens Shields

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

### Corner Mirrors

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

### Replacement parts

<b>STP-2</b>	specified test piece 19 mm	3039026
<b>STP-3</b>	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.