

Sentinel

PRESS BRAKE
GUARDING SYSTEM



Sentinel

Sentinel is an advanced press brake guarding system designed for retrofit applications. Sentinel provides the highest level of operator protection while maintaining machine productivity and performance.

Sentinel laser protection

The Sentinel laser transmitter and receiver are mounted to the upper beam of the press brake. A continuous block laser field protects the zone directly below the punch tip allowing the operator to hold the work piece as the tools close at high speed. If an obstruction is detected the machine is automatically stopped.

1. Automatic Mute Point Set-up

The 6mm mute point set-up is automatically initiated on the first cycle. The laser detects the material surface and the operator is prompted to confirm the mute point via the user interface panel. Sentinel automatically monitors the mute position and detects changes in tool size and material thickness.

2. Sentinel user interface panel

The 4.3" colour graphics display makes the system very simple to operate. A magnetic backing allows the panel to be easily moved.

3. Laser Transmitter (TX)

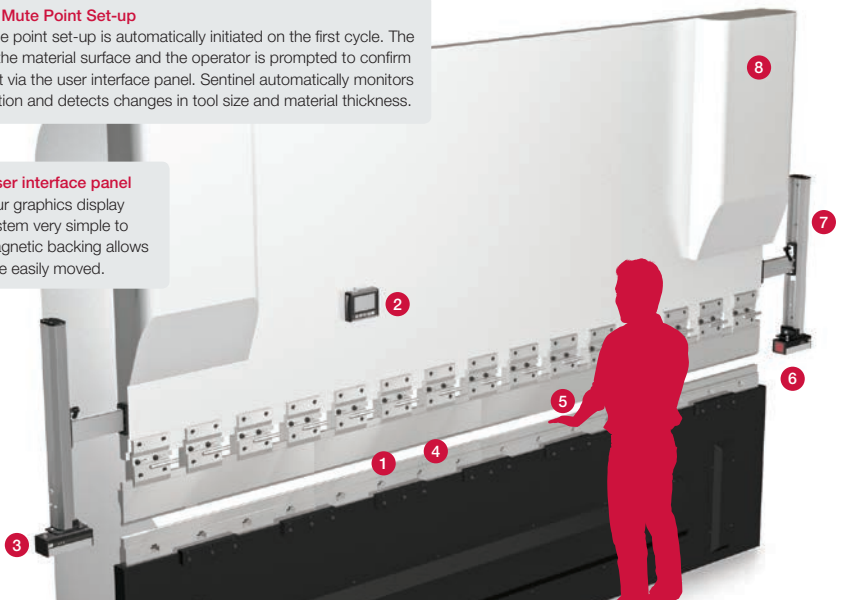
As the tools close in high speed the sensors are progressively muted while machine deceleration and speed is monitored. The system provides optical protection until the tool opening is 6mm.

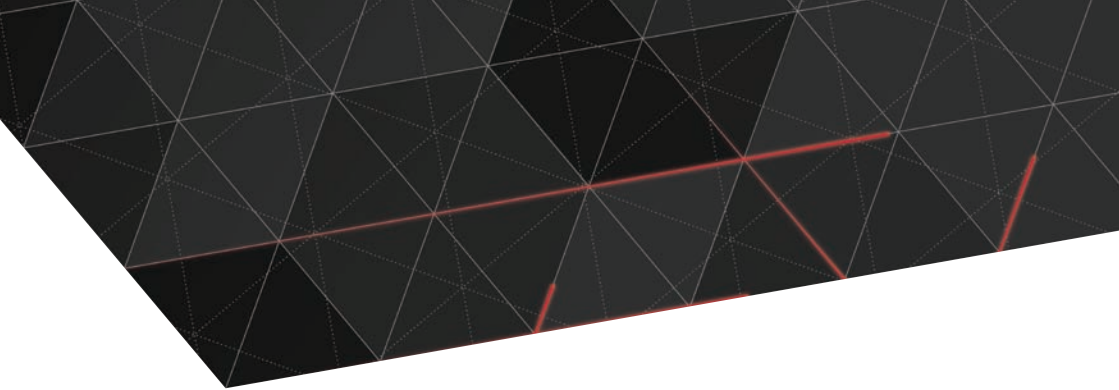
4. RapidBend

RapidBend technology maintains machine productivity by enabling the tools to close in high speed until the opening is only 6mm.

5. Close Proximity Protection

Sentinel enables the operator unrestricted access to the tooling area. The operator can hold the work piece as close as 20mm from the bend line and operate the machine safely in high speed. This increases productivity and reduces operator fatigue – no more stepping in and out of the tool area as with traditional light curtains.





This close proximity protection allows the operator unrestricted access to the point of operation for increased productivity and unlike traditional light curtains, reduces fatigue by enabling the operator to remain standing in the same position.

8. AutoSense

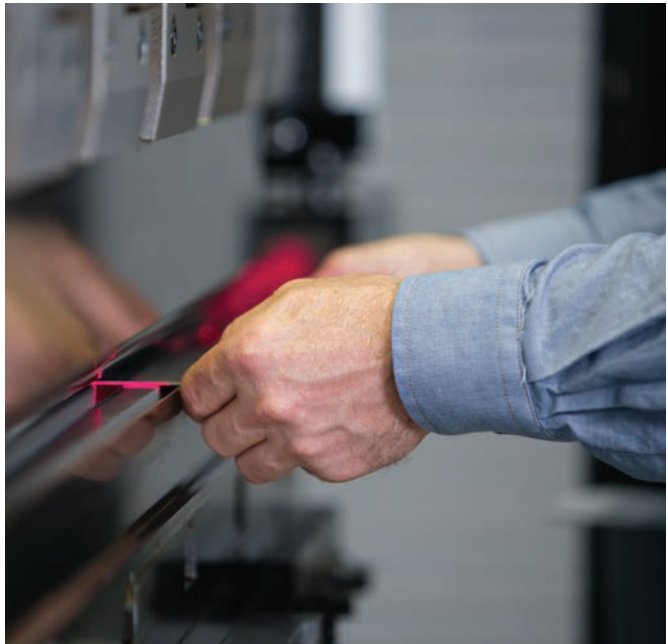
AutoSense technology automatically monitors machine performance in real time.

7. Quick adjust brackets

The TX and RX can be quickly moved and locked clear during tool change, are very easily adjusted and highly tolerant to machine vibration.

6. Laser Receiver (RX)

The RX features a wide reception zone to eliminate the need for precise manual adjustment after tool change and is also highly tolerant to machine vibration. Integrated status LEDs make setup and adjustment very simple.



Sentinel technology

Our patented technology is designed to enhance operator protection while maintaining machine productivity and performance.

RapidBend technology

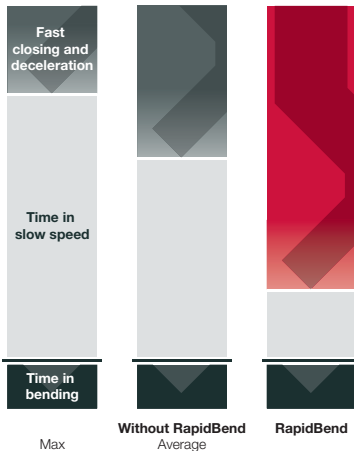


employs a patented progressive muting process that enables the press brake to close safely at high speed until the tool opening is only 6mm. This reduces the slow speed travel distance to enhance machine productivity. RapidBend is compatible with most synchronised CNC press brakes* and in comparison to other light or laser based systems, RapidBend can reduce machine cycle time by up to two seconds per cycle. This represents a significant saving in operating time and cost.

AutoSense is an automatic monitoring technology that



tracks machine operation and performance in real time. AutoSense automatically monitors control commands, motion, direction, speed and stopping performance to maintain a high level of machine and operator protection. AutoSense also guarantees compliance with international safety standards that mandate automatic monitoring of machine overrun and safe speed.



**For retrofit applications, RapidBend can reduce the minimum speed change point to 6mm, however results may vary depending on the press brake type and capabilities. Consult your Lazer Safe Retrofit Dealer for more information .*

Sentinel user interface panel



The Sentinel panel displays system and machine status in real time and provides the operator with simple to follow instructions and messages making the system very easy to operate. The active status of the optical protection is clearly displayed and the operator can quickly change guarding modes with the press of a button.

The panel features a magnetic backing allowing it to be placed on the front of the machine within easy reach and view of the operator.

Support for up-acting machines

Sentinel includes dedicated modes for up-acting press brakes such as Amada RG models. For most up-acting machines, Sentinel eliminates the need for complex and expensive hydraulic and electrical modifications during installation and on some models that are equipped with a treadle bar, can retain the ability for the treadle to control the ram motion and speed during bending.

External Device Monitor (EDM)

Sentinel provides the option to connect and monitor up to four external devices such as valve sensors or relays. The EDM response time is configurable and the status of each external device is displayed on the user interface panel in the event of a device failure.

Dual guarding support - the best of both worlds.



In addition to laser guarding, Sentinel enables connection of third party light curtains for the ultimate flexibility. For bending operations where light curtains are more suitable (eg. multi-height tooling), the operator can simply switch from laser protection to light curtain protection.

Additional machine monitoring

Sentinel provides optional monitoring of additional machine safety elements including emergency stop buttons plus side and rear gate interlock switches with real-time status displayed on the user interface panel.

Mounting bracket options

Sentinel is available with two mounting bracket options. A range of vertical lengths are available to suit various machine and tooling applications.

Linear Brackets are supplied as standard and are suitable for press brakes up to 8 metres in length. The brackets are manufactured from an extruded high-tensile alloy for greater rigidity and tolerance to machine vibration while linear bearings and rails provide precision vertical adjustment of the laser transmitter and receiver.

During tool change, a spring loaded locking pin keeps the transmitter and receiver clear, allowing the tools to be loaded from either end of the press brake. After tool change, the transmitter and receiver are quickly moved back into position. The receiver status LEDs provide a clear indication of when the system is aligned, so the tool change process is very simple and takes only a matter of seconds.

Economy Brackets are available as an option and suit machines up to 4 metres in length. The brackets are manufactured from an extruded alloy and feature a two part sliding design for quick vertical adjustment. The brackets are easily adjusted and locking into position with a simple locking handle.



Economy Brackets



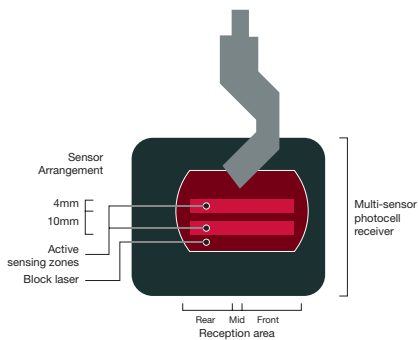
Linear Brackets

	Economy Brackets	Linear Brackets
Specifications		
Vertical bracket length	700mm	520mm / 700mm / 1000mm
Vertical adjustment range	488mm	350mm / 530mm / 830mm
Horizontal adjustment range	40mm	40mm
Machine length recommendation	Up to 4 metres	Up to 8 metres
Main Features		
Adjustable locking handle	●	●
Precision linear bearings and rails		●
Free sliding design		●
Tool change locking pin		●

How it works

The laser field is processed by the receiver and divided into two rows of three continuous zones to detect obstructions entering from the front, sides and rear of the tool area.

The front zone provides protection forward of the tool while the middle zone protects the area just behind the tip of the punch. The rear zone provides additional protection for the open gaps created when segmented tooling is used. The protective zones are independently and automatically muted to suit different shape work pieces allowing parts to be formed safely at high speed to achieve maximum productivity.



Muting

Muting temporarily deactivates optical protection just before the punch makes contact with the material allowing the bend to be completed. On start-up Sentinel automatically determines the mute point by detecting the material position. During operation the optical protection is automatically muted when the tool opening is 6mm, reducing the chance of an operator's fingers or hands entering this small space between the punch and material.

Sentinel automatically monitors the material position on every bend so changes in material thickness or tool size are detected and the machine automatically stopped. After a tool or material change the operator simply initiates a new mute point set-up cycle with the press of a button.

Operating modes

Sentinel features a range of modes to suit different shape and profile work pieces. At the press of a button, simply select a mode that best suits each bend job to achieve the best level of productivity and performance.

Normal Mode

In Normal Mode all sensors are active, allowing the tools to close safely at high speed. If any sensor is blocked, the machine is automatically stopped. If any sensor remains blocked then the bend can be completed at 10mm/s safe speed.

Tray Mode

Tray Mode is designed for bending tray or box shaped work pieces where the side flanges block the front or rear sensors. In Tray Mode all sensors are active and the machine is stopped if a side flange is detected. The operator presses the pedal again to confirm the presence of the side flange then the system automatically blanks the front and rear sensors and the bend continues at high speed.

Mute Stop Mode

Ideal for forming parts with side flanges that block the entire sensing zone. The tools close at high speed and stop automatically at the mute point allowing the operator to simply insert the work piece then press the pedal to complete the bend.

Back Gauge Mode

Back Gauge Mode is designed for bend cycles where the back gauge fingers are positioned very close to the bend line and detected by the rear sensor.

To maintain protection while avoiding unnecessary interference the rear sensor is automatically blanked just above the back gauge fingers so the bend can be completed without stopping.

Field Muted Mode

In Field Muted Mode the optical protection is turned off and closing speed restricted to 10mm/s safe speed. Field Muted Mode is ideal for bending operations where the laser transmitter or receiver must be moved clear to accommodate work pieces that extend past the ends of the machine bed.

Tool Set-up Mode

Traditional guarding systems can interfere with machine tool set-up and referencing that can lead to longer set-up times or the need to bypass the guarding system entirely. Sentinel Tool Set-up Mode eliminates interference and enables tool set-up and referencing to be performed quickly and easily.

Light Curtain Mode (optional)

Sentinel allows the operator to set the material position then automatically calculates the light curtain mute point at a 6mm tool opening. During operation Sentinel automatically monitors machine stopping time whenever the light curtain is interrupted and on every machine stop. Sentinel also provides flexibility with safe speed operation. If the light curtain is interrupted when the tool opening is greater than 6mm then the bend can be completed at 10mm/s safe speed.

Product specifications

Sentinel Press Brake Guarding System

Controller

Hardware	CE Certified Category 4 Safety Controller with integrated force guided relays and encoder feedback system
Software	CE Certified Kernel Software with application software interface
Technology	RapidBend / AutoSense

Laser transmitter / receiver

Laser transmitter	CLASS 1 Block Laser
Receiver	Multi-sensor photocell receiver
Maximum recommended optical range	8 metres / 26 feet
Object detection resolution	4mm
Minimum speed change point	6mm
Connector type	M12 8 pin
Tool compatibility	V tools and non standard tools
Integrated status LEDs	Transmitter status (power / laser A/B) Receiver status (power / front/middle/rear sensors)

User interface panel

Display	4.3" widescreen colour graphics display
Connector type	M12 8 pin

Mounting brackets

Economy Brackets	Optional
Linear Brackets	Supplied as standard

Certification and standards compliance

Sentinel hardware and software is CE Certified and compliant with all international press brake safety standards including EN12622, ANSI B11.3-2012, CSA Z142-10 and NR12.

Sales and installation

Sentinel is available supplied and installed from Lazer Safe Retrofit Dealers, the original press brake manufacturer and participating machinery dealers.

For your nearest Lazer Safe Retrofit Dealer visit www.lazersafe.com.

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Patents

Lazer Safe products are subject to patents granted or applied for in various global territories.

LS-MKT-M-005 v2



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