Compare the productivity benefits

Lazer Safe’s block laser system provides safe high speed closing down to just 2mm. Compared with other guarding systems or even unguarded machines the block laser system can save up to 2 or more seconds per cycle. For every 1000 cycles the block laser system can save you over 30 minutes in operating time.

| Lazer Safe Block Lazer | 0.2 |
| Lazer Safe L73-004-115 | 0.6 |
| Unguarded Machine | 0.6 (min) |
| Other light or laser guarding systems | 1.2 (min) |
| | 1.9 (average) |
| | 2.2 (max) |

Comparison time in slow speed closing (seconds per cycle)

All levels of Lazer Safe guarding and productivity enhancement technologies are fully available to all press brake manufacturers. The world’s leading manufacturers have embraced Lazer Safe’s technology for the benefit of their customers. The Lazer Safe systems enhance all levels of press brake so there is no reason for you to miss out.

Ask your machinery supplier for Lazer Safe when ordering your new press brake.

For more information visit www.lazersafe.com.au or contact:
Press Brake Productivity Enhancement Systems

Lazer Safe’s range of Productivity Enhancement Systems can significantly increase the productivity level of your press brake by reducing cycle times and ensuring product quality and consistency.

Key Features

Increased Productivity
- 2mm change of speed point
- Faster closing speed
- Faster cycle time

User Friendly Operation
- Automatic adjustment
- CNC integration
- Fast and simple set-up

Operator Security
- Broader safety zone
- Eliminate tool clash
- Tool damage protection

Angle Confirmation (optional)
- Instant calculation
- Production quality and consistency
- Eliminate material wastage

Advanced operator security
The block laser system provides a complete safety zone around the punch. This provides the ultimate security against operator injury and also protects the tools against damage that can result from incorrect set-up or objects left on the die.

Advanced machine diagnostics
Advanced diagnostic functions monitor the press brake and alert the operator of the machine status and report any operational changes or faults to minimize downtime.

2mm change of speed point
Lazer Safe’s block laser system provides safe high speed closing down to just 2mm. Compared with other guarding systems or even unguarded machines the block laser system can save up to 2 or more seconds per cycle.

High speed operation
The block laser system allows safer high speed operation. This enables the machine to operate with a faster closing speed to increase productivity.

Angle Confirmation
High speed digital image processing technology measures the angle of the formed work piece on every cycle. Standard features include tolerance on bend angle, tolerance on ‘warp’ (bend inconsistency over length of the bend) and an out of tolerance alarm. When supported by the CNC system the data transfer can allow additional functions such as visual alert to the operator if a bend angle is out of tolerance and/or automatic correction to the bend program with re-bending.

CNC integration
Safety and guarding functions are integrated into the CNC system. Angle Confirmation support varies depending on the CNC model (details can be provided by the CNC or press brake manufacturer). This streamlines and simplifies operation with many automatic functions that do not require any operator interaction.

Automatic Set-up
The AUTO ALIGN button on the camera receiver automatically images the punch and adjusts the safety zone. This eliminates the need for precise manual adjustment and simplifies the set-up process.
IMG-100 ESA System Configuration
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1 Angle Confirmation

Angle confirmation is the process of confirming to the press brake operator that the finished bend angle of the work piece, for each bend step, corresponds with the actual CNC programmed angle. Confirmation of the bent angle can be made through a CNC developed interface. Either of the interfaces mentioned which communicate with the CNC require information regarding the following bend to be transmitted to the computer performing the angle measurement. This document describes how the interface is achieved and what components are required by the angle confirmation system.

1.1 Angle Confirmation with ESA

Shown below in Figure 1-1 is an overview of the system components required for interfacing the IMG-100 Imaging System. The resulting angle information is displayed in the ESA CNC.

![Figure 1-1: Angle Confirmation](image)

1.1.1 System Hardware Components

1. **ESA (CNC)** requires the IMG100 software and a spare input, which will be driven from an output on the PCSS counter card. The IMG system uses an FGC03 guard counter module.

2. **Press Control Safety System (PCSS)** is a safety controller that monitors the machine operation to ensure that it remains safe for the machine operator. The PCSS communicates with the CNC, monitors inputs, validates outputs and uses guarding information from the receiver to provide safety and guarding to the machine operator.
3. **Lazer Transmitter/Receiver** are emitting and receiving devices which provide a guarded area around the punch which is fitted to the beam of the press brake. Through monitoring of this area above and below the tip of the punch by the PCSS protection is provided to machine operator. The IMG system uses a block of laser light to perform the guarding and angle confirmation functions.

### 1.1.2 CNC Actions

The programmed bend angle and various other parameters are required by the Imaging PC. Sending of the data is achieved by Ethernet connections between the Imaging PC and the CNC.

### 1.1.3 PCSS Actions

A cycle that learns the position of material release or end of relaxation is called the learning stroke. The learning stroke is selected using the IMG panel. During this stroke the machine will bend the material as normal and during up movement, after decompression, the PCSS will slow the machine and continue to capture images. When the IMG software detects that the resulting angle changes by less than 0.4 degrees then this position is stored in the IMG100 database. Normal up movement is then allowed by the PCSS.

A cycle that uses the learnt position, as mentioned above, to capture an image at the end of relaxation is called the angle confirmation stroke. The angle confirmation stroke is selected using the IMG panel. During this stroke the machine will bend the material as normal and during up movement, after decompression, the PCSS will slow the machine until the stored end of relaxation position and then capture one image. Normal up movement is then allowed by the PCSS.

### 1.1.4 Learning Stroke

The purpose of the learning stroke is to determine the end of relaxation position. This is achieved by capturing images while moving slowly up after decompression. The IMG software processes the images taken and determines the position for end of relaxation.

A database is stored by the IMG temporarily which records the end of relaxation for a specific angle, material thickness and type.
In Figure 1-2 above the control of the beam for learning is managed by the PCSS through a control signal from the guard counter module. This control signal requires a connection to the CNC which instructs the CNC to move up in slow speed.

After the material has been pressed to bottom dead centre (BDC) the IMG computer will capture a BDC image. After BDC has been detected the PCSS will instruct the CNC to move slowly upward (2mm/sec) and image requests will continuously be made. When the IMG software detects that the captured angle has stopped changing it determines the end of relaxation position. Normal up movement of the beam can then be resumed.

1.1.5 Angle Confirmation Stroke

The purpose of the angle confirmation stroke is to use the end of relaxation position stored by the IMG software as the correct point to perform an image capture. An image taken at the position stored in the represents the end of relaxation.

Figure 1-2: Learning stroke

Figure 1-3: Angle confirmation
In Figure 1-3 above the control of the beam for angle confirmation is managed by the PCSS through a control signal. This control signal instructs the CNC to move up in slow speed.

After BDC has been detected the PCSS will instruct the CNC to move slowly upward (2mm/sec) and the PCSS will also begin monitoring for the learnt position stored by the IMG software. When the position is reached the PCSS will trigger an image capture which will show the final angle of the bent material. The bend information will be displayed to the operator through the IMG panel.

1.2 IMG-100 System Connections

This section describes the connections necessary for the IMG-100 imaging system when being interfaced with a CNC.

1.2.1 Ethernet Connections

A standard CAT5 Ethernet cable is required between the CNC and the IMG Receiver. Depending on the network topology a hub or router maybe required.

1.2.2 Additional Connections

An additional physical connection between the PCSS and a spare input on the CNC is required.

1.2.3 Forcing slow speed

When the machine is moving up after decompression and the FGC03 Out 2 is high the CNC should force the machine to move up slowly (about 2mm/sec). The IMG system can not take clear accurate images while the machine is moving fast. Please see Figure 1-2 and Figure 1-3 for the state of the FGC03 Out 2 signal.
2 IMG Software

2.1 IMG100

The imaging software will display information as shown in the in Figure 2-1 below.

![Sample IMG-100 screenshot](image)

**Figure 2-1**: Sample IMG-100 screenshot

Displayed in the image above are four important pieces of information which include the measured bend angle, warp angle, confidence and tolerance.