OEM Embedded Systems

FOR PRESS BRAKES

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CN12
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Optical protection

The LZS Series and IRIS Series provide superior optical protection while maintaining the highest level of productivity and performance.

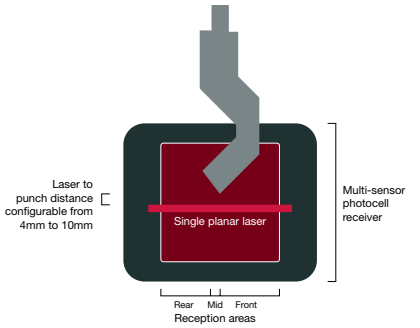
Close proximity protection enables safe handling of the work piece during high speed closing.

Optical protection systems comprise a laser transmitter and receiver that are mounted to the upper beam of the press brake. A continuous 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.

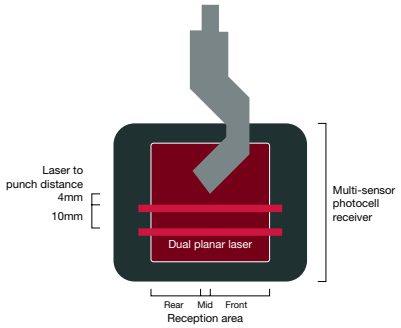
This close proximity protection allows the operator unrestricted access to the point of operation for increased productivity and unlike traditional light curtains, reduces fatigue by enabling the operator to remain standing in the same position.

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

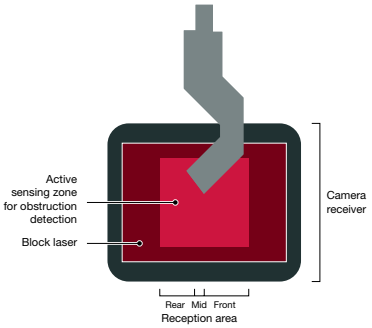
The front zone provides protection forward of the tool while the middle zone protects the area just behind the tip of the punch. The rear zone provides additional protection for the open gaps created when segmented tooling is used. The protective zones are independently and automatically muted to suit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



Applies to LZS-LG and LZS-004



Applies to LZS-LG-HS and LZS-004-HS



Applies to LZS-005, IRIS and IRIS Plus

IRIS optical imaging

IRIS is an Integrated Real-time Imaging System that provides the press brake manufacturer with greater functionality by combining optical protection with real time image processing. IRIS comprises a laser transmitter and receiver mounted to the upper beam of the press brake with a high speed digital camera and image data processing system contained within the receiver unit.

As a combination system, IRIS provides optical protection while the tools are closing at high speed then once the bending process starts, the optical imaging function takes over. During bending IRIS takes and processes images in real time and transfers data to the CNC system via SmartLink. The image processing system and software is fully contained within the IRIS receiver so no additional processing hardware or software is required.

IRIS optical imaging is a flexible, open platform technology that enables the press brake manufacturer to utilise the image data (via SmartLink) to implement user features in the CNC system such as Bend Speed Management, Dynamic Angle Control and Active Angle Control.

The image data processed by IRIS can be used to implement a wide range of additional user features in the CNC system through development of custom software applications. IRIS requires custom integration with the CNC system by the press brake manufacturer and the functionality and features will differ depending on the CNC system used and how the overall process is implemented by the manufacturer. Advanced functions will require the manufacturer to develop supporting CNC system software.

The functions enabled through IRIS technology not only improve press brake functionality, performance and efficiency but can be tailored to suit the personality of the manufacturer's machine design and brand.

** IRIS Plus model shown*

Bend Speed Management

The European press brake standard EN12622 mandates that bending speed be restricted to 10mm/s. This speed restriction provides a general level of safety by managing the speed at which the material facing toward the operator moves during bending. However in the machinery directive and EN12622 there are clauses that provide a basis for faster bending speeds with wider V dies, provided certain operations can be properly monitored.

In the CNC system the manufacturer can set a faster bend speed for larger width V dies. To facilitate a safe condition for faster bending the bend speed management process provides automatic monitoring of the speed at which the material facing the operator moves through its bending arc. To do this, IRIS processes real time images of the bending process and calculates the angular velocity of the moving sheet to measure the speed at which the part is being formed. If the angular velocity with a wider V die is sufficiently less than the speed when using narrower V dies then a faster bending speed is permissible. This calculated speed is compared with the die width programmed in the CNC and if within the angular velocity threshold, allows the machine to continue bending the material at a speed greater than 10mm/s.

Bend speed management continuously monitors the bending process so in the event the angular velocity exceeds the maximum threshold or the operator selects an incorrect die width then the machine is stopped and the bend can be completed at 10mm/s.

Active Angle Control

Active Angle Control is designed for single parts or small batch production. During operation the bend is briefly paused prior to reaching the programmed angle while real time images are processed to calculate the material spring back. The bend is then resumed and the spring back calculation is used to automatically control the bending depth. After decompression the the final angle is automatically confirmed before proceeding to the next bend. Active Angle Control is a highly accurate angle control process that ensures spring back is calculated for each individual bend to achieve the correct angle.

Dynamic Angle Control

Dynamic Angle Control is ideal for high speed processing of volume production parts. When the first part is formed Active Angle Control is initiated to automatically calculate the spring back of each individual bend in the part. After spring back is calculated for the first part then Dynamic Angle Control is activated. Dynamic Angle Control uses real time angle data and the spring back calculation to automatically control the bending depth and the final angle is automatically confirmed after decompression before proceeding to the next bend. Dynamic Angle Control is a high speed process that ensures accuracy and consistency between parts with no delay to the bending operation.

Spring Back Calculation

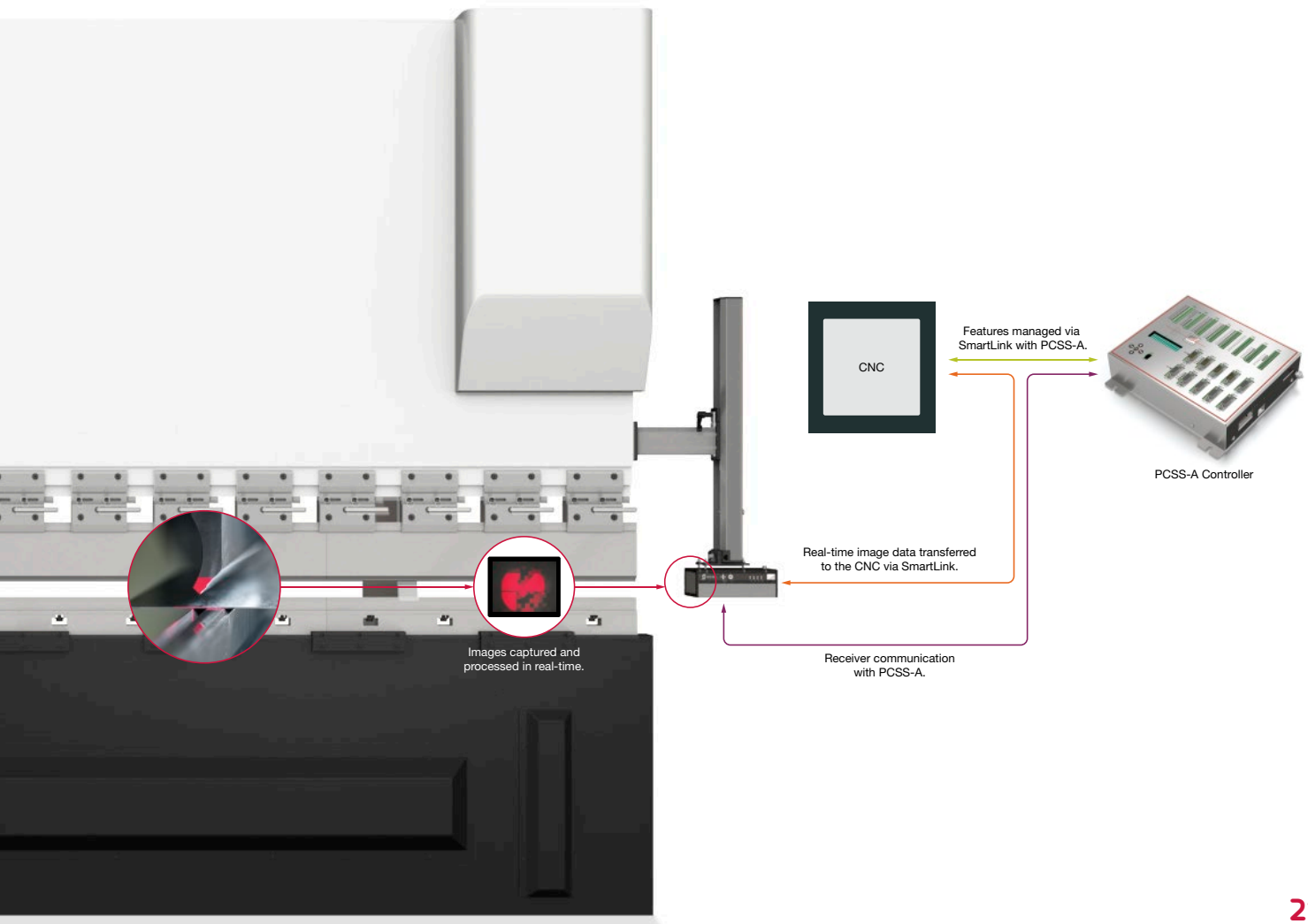
Spring Back Calculation is a function that reliably and accurately measures and calculates the spring back of the material. At various stages of the bending process the tool movement and decompression is controlled while real time images of the material are processed to measure variations in the angle of the part to automatically calculate spring back.

Final Angle Confirmation

Final Angle Confirmation is a function where, during decompression, IRIS processes real time images to automatically detect the material relaxation point and measure the final bend angle.

IRIS Model Comparison

	IRIS	IRIS Plus
Optical range (metres)	8m	4m
Bend Speed management	●	●
Active Angle Control		●
Dynamic Angle Control		●
Spring Back Calculation		●
Final Angle Confirmation		●



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