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**Safe efficient bending:  
the Smart Light Curtains  
solution**





# Safe efficient bending: the Smart Light Curtains solution

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# Safety of press brakes: no guarding is not an option

- The guarding technology depends on the application (no one solution fits all...)
- Regulatory standards per region define responsibilities:
  - North America: ANSI B11.3
  - Europe: Machinery directive & EN 12622



# Basic safety concepts

## Non-functional safety:

- Restraints, pull-backs, two-hand controls + stroke-stop
- Mechanical fixed barriers, movable barriers
- Guarding by safe speed, guarding by safe distance

## Functional Safety:

- Standard light curtains
- Laser devices
- Smart light curtains ← **New!**



# Standard light curtains

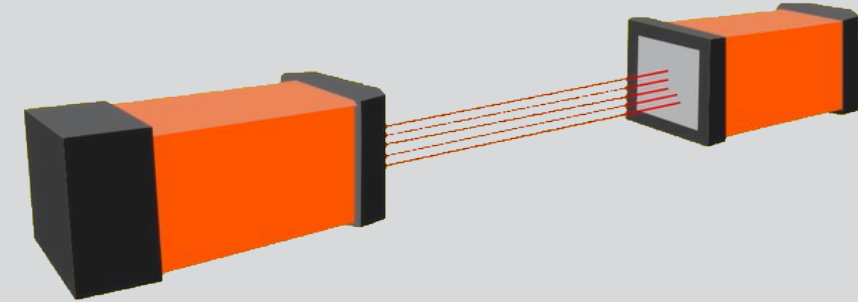
- Blanking and floating capabilities
- Mounting at the safety distance (formula)
- Effective, flexible, easy to work with
- Varying flange heights is a problem →
- But loading parts at the mute point works





# Laser devices

- Handle pieces up close to the dies
- Easy to handle small parts bending
- Stopping distance (in place of safety distance)
  - critical calibration and position adjustment
- Slow speed required for many operations
- Setup time (tool changeovers)
- Installation/retrofitting complicated
- Integration with the machine control



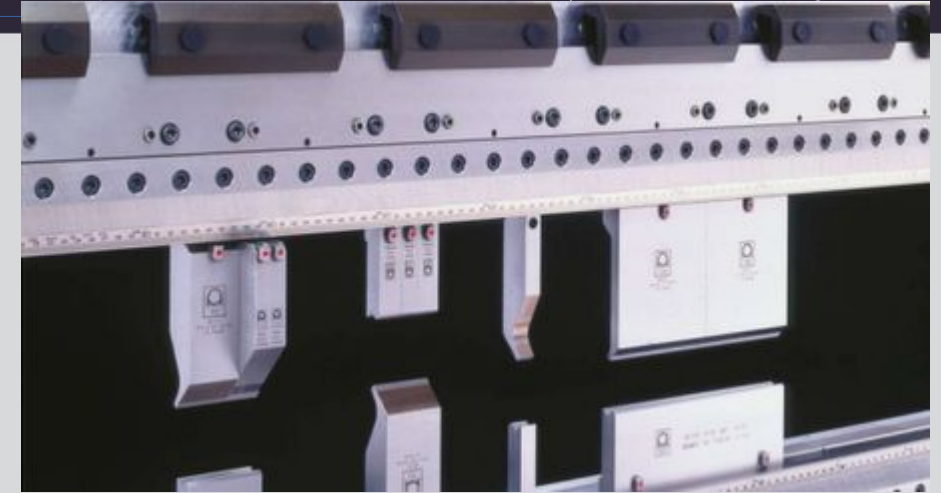


# Laser devices

## Conflicting operations:

- Staggered tooling heights
- Radius tooling
- Hemming dies
- Joggle tools

It does not protect the front section of the press brake







# Smart light curtains

## Merlin 4000 PRO





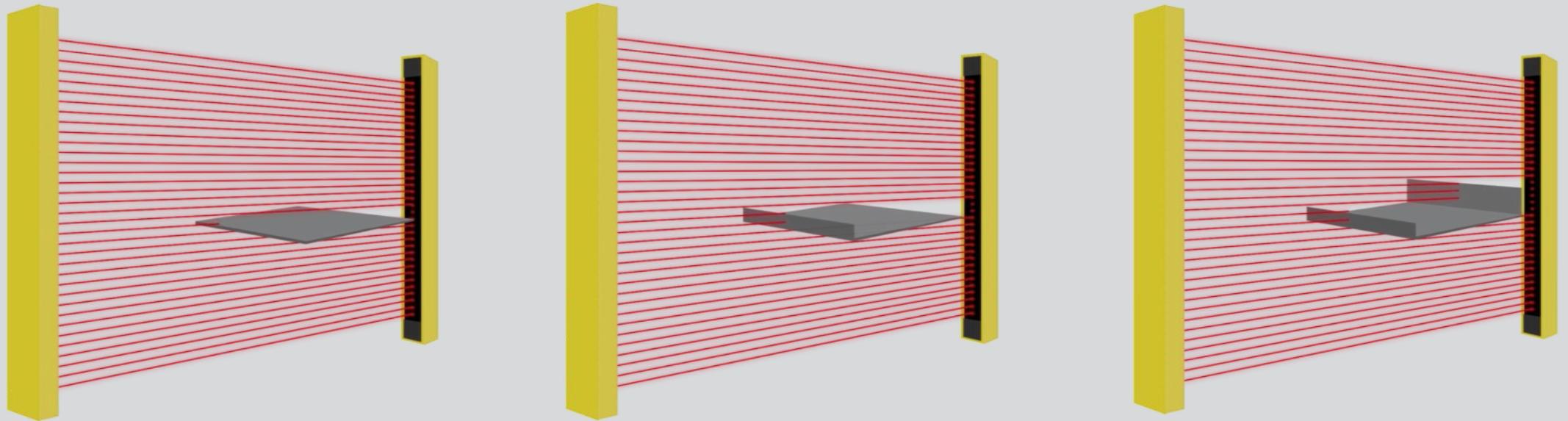


# The Merlin 4000 PRO

- Based on Smart Safety Light Curtains
- Allows for stationary support arms
- Learns the profile of each step of the part fabrication process
- Jobs can be stored in memory and recalled later
- Smart Blanking means operators hands are safe!
- Visual aids in the light curtain help positioning the part
- Easy to use, just follow the prompts in the screen
- Crush zone protection with a separate set of light curtains
- Provides full front guarding (ATCs included)



# The Merlin 4000: How it works?



Dynamic Blanking + Smart Blanking !



# The Merlin 4000 PRO

- No adjustments, no calibration, no tool changeover setup
- Requires NO integration with the press control
- Safe speed is NOT required (max performance of the press)
- Works with all types of tooling
- Protects the entire front of the brake (including ATC systems)
- Additional light curtain prevents crashing against the ram
- PSDI modes are allowed !

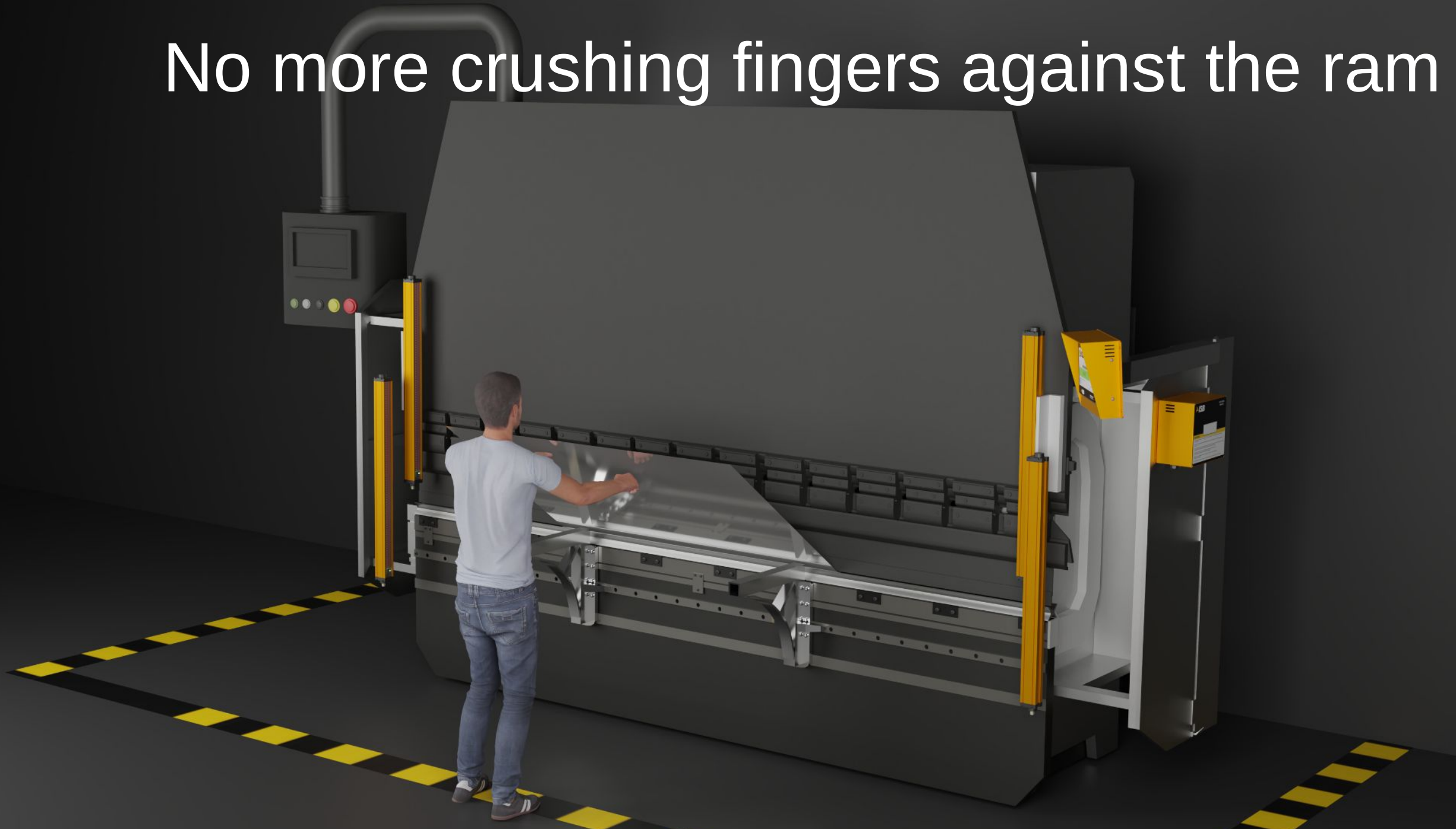


# No more crushing fingers against the ram

2 versions available:

- Merlin 4000 PRO with 2 sets of light curtains
- Standalone crush zone guarding

No more crushing fingers against the ram



# Merlin 4000 PRO

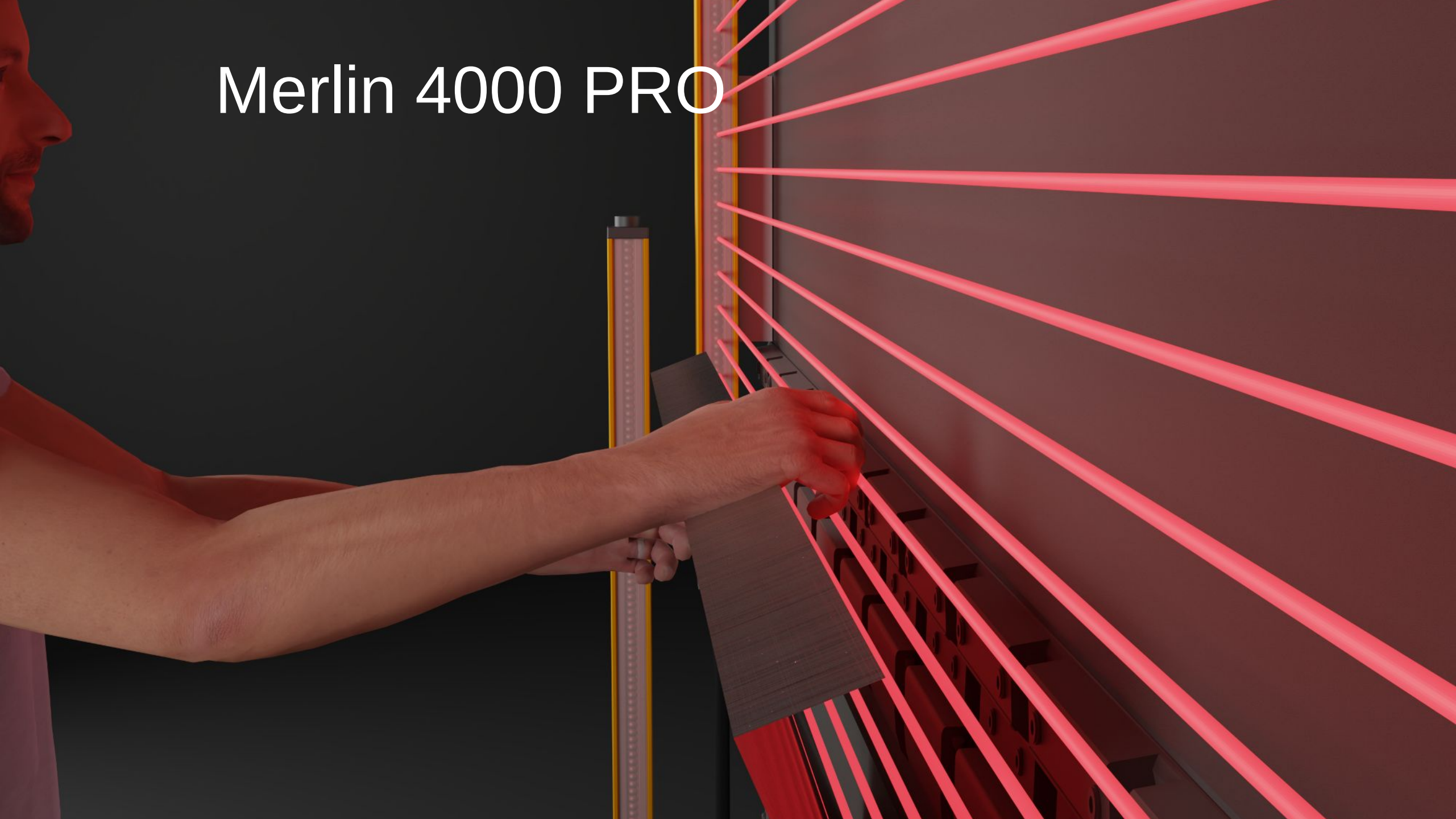




# Merlin 4000 PRO



# Merlin 4000 PRO

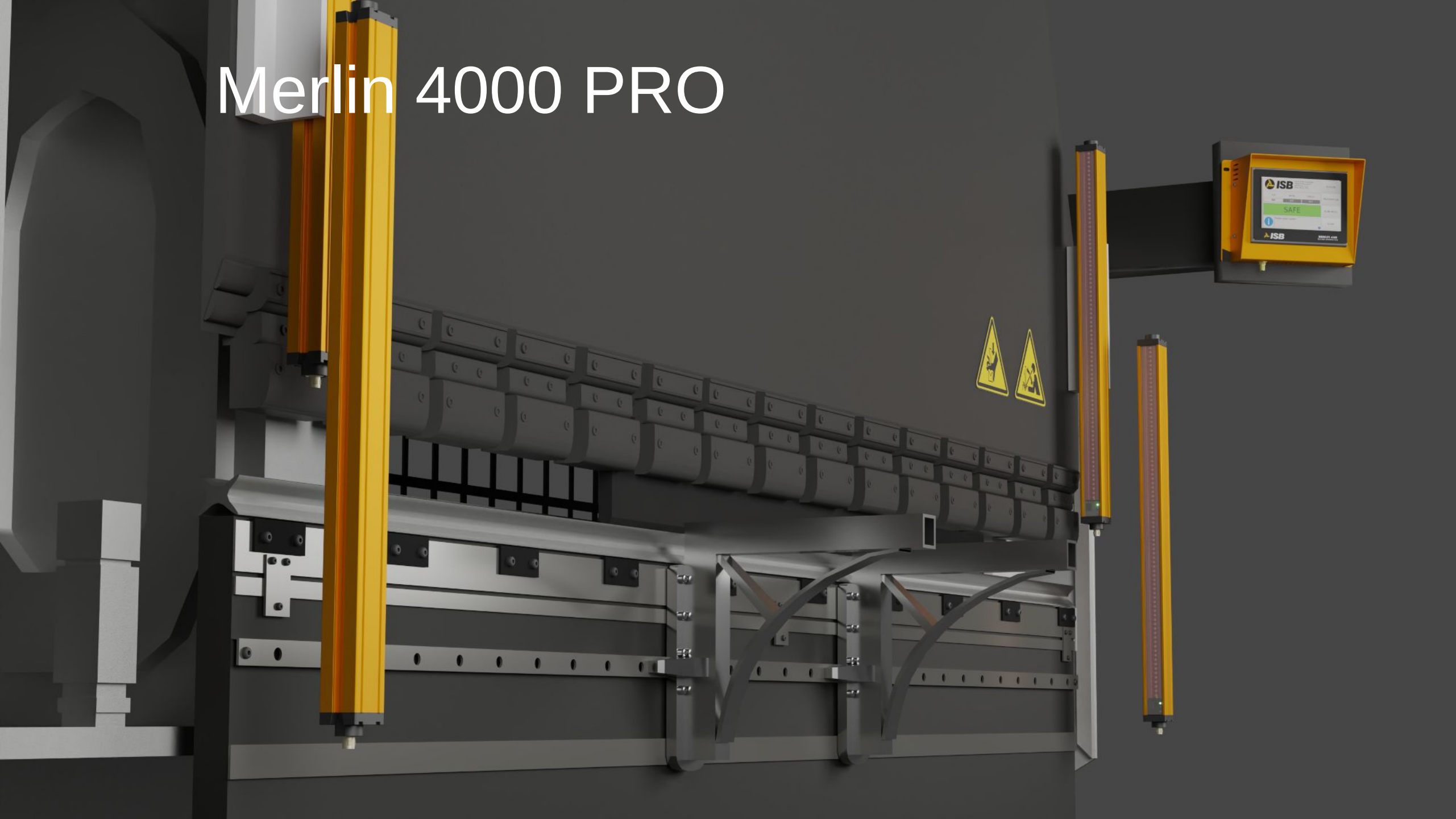


# Merlin 4000 PRO





# Merlin 4000 PRO

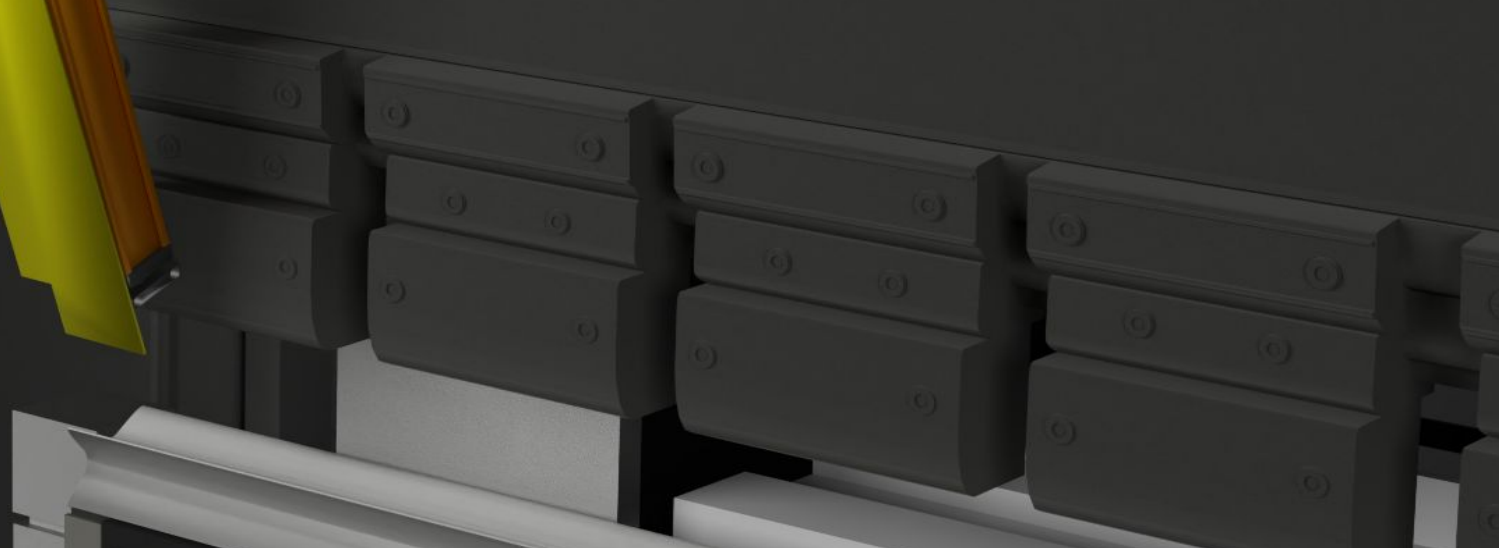


# Merlin 4000 PRO





# Merlin 4000 PRO







# Compliance with international standards

- Fully certified type 4 AOPD specifically for press brakes
- Compliant with CE requirements (machine directive)
- Compliant with US, CAN standards (UL, CSA, OSHA)
- Certified by:
  - TÜV Rheinland (IEC 61496, application area EN 12622)
  - UL (UL 61010-1, CAN/CSA-C22.2 No. 61010-1-12)



# Additionally...

- Uses field proven MX4000 series of light curtains
- Based on the legendary Merlin 3000 system
- All major brands of press brakes have already used it
- Multi-language interface: English, Spanish, French, ...
- USB port for memory backup and sharing jobs
- It's cost effective !
- **Unique full guarding solution in the market !**



# The Merlin 4000 PRO



**Welcome to the  
era of the Smart  
Light Curtain !**



# About ISB: major milestones

- 1972: first company to use LED's to develop a safety light curtain
- Several generations of light curtains followed
- 1980: the first microprocessor based press control
- 1985: a unique capacitive run button
- 2004: RBPC, compact and economical resolver based press control
- 2012: MX4000, a Type 4, PLe, SIL 3, series of safety light curtains
- 2019: Merlin 4000
- 2024: **Merlin 4000 PRO** Press Brake Safeguarding package.



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*Thanks !*