Technical guide

Laser marking

Elements of a complete laser marking solution

A complete laser marking solution consists of more than just the laser marker itself. There are several additional components and accessories that are necessary for a complete solution. These items need to work together to integrate and operate seamlessly in an industrial production environment. It is important to consider all of these components during the evaluation, purchase, and integration of a project to help ensure the system will operate safely and consistently for many years.

Laser solution components

Laser marking system

A laser marking system consists of four components:

- Marking head – emits the laser and marks the product
- Beam source – generates the power required for the laser
- Umbilical – connects the marking head to the other components of the system
- Controller – the interface operators use to interact with the laser system

Beam shield

Beam shielding is mandatory for a Class 1 laser solution. This shielding protects operators and the surrounding environment from direct or scattered laser radiation. The beam shield material will depend on both the laser type and wavelength being used. In many cases, beam shielding is custom made to match production requirements.

Mechanical mounting

Sturdy mechanical mounting is critical to the integration of the laser. The mounting frame must be strong enough to hold the system and to prevent any vibrations from reaching the laser. Mounting options include stands positioned beside production lines or mounts inside production machines.

Exhaust unit/fume extractor

Exhaust units remove fumes from the laser marking area and filter them. Extraction protects the operators and products from fumes generated when laser marking. The size and type of the exhaust unit depends on the substrate material, laser type, and laser wavelength.

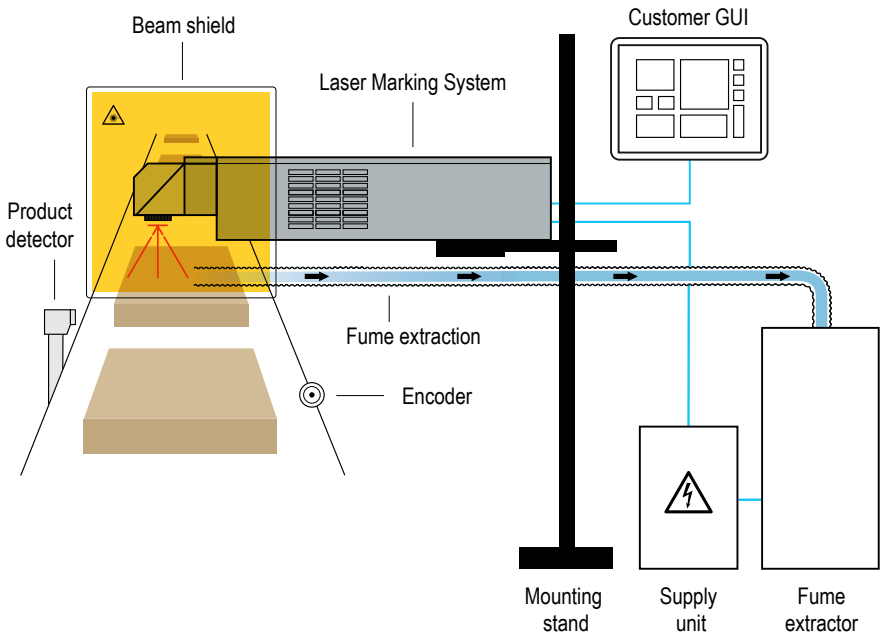
Trigger sensor and encoder

Trigger sensors and encoders are used to identify the speed and position of product that is heading towards the marking unit. These measurements are then sent to the laser system for accurate marking on the product.

Signal exchange with external system

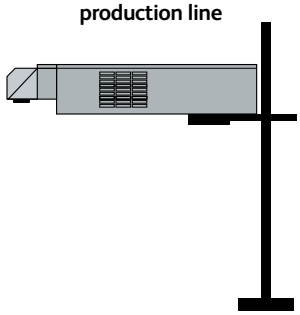
Signal exchange is important for integration with other industrial equipment. This functionality allows for the exchange of marking content, system status, and error modes across an entire production facility.

Full laser marking system solution:

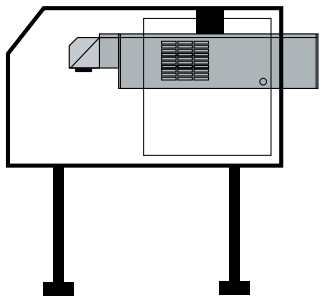


Mounting options:

On a laser stand beside production line



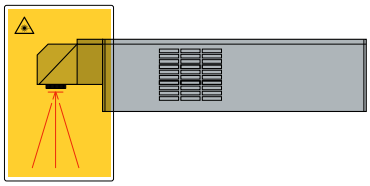
Inside a production machine



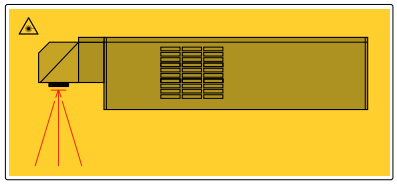
Beam shield options:

Laser beam exit only

Entire marking head



Full laser marking unit



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