

Laser + Camera = Innovation

Machine vision is making laser material processing even more flexible, accurate and cost-effective

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The use of modern laser technology has become standard in industrial manufacturing thanks to its speed, accuracy and effectiveness. Lasers are used to engrave parts, electronic printed circuit boards or chip cards. They perforate packaging, structure semiconductor wafers, drill, cut and weld plastics or metals, and create highly complex structures via 3D printing – all contactless, with no application of force and wear-free.

Conventional systems for laser material processing require a large number of individual components and involve high integration costs in terms of mechanics and control software. Depending on the application, a system has to inspect the characteristics of each part even before laser processing begins. Following the laser process, an additional unit then inspects the quality. The positioning of the parts in the laser system determines its accuracy to a

Company

RAYLASE AG

Wessling, Germany

RAYLASE offers highly accurate components for the fast deflection and modulation of laser beams. They consist of first-class optics, galvanometer scanners and control electronics with intuitive software interfaces. Customers from all over the world build on the unparalleled performance and reliability of our deflection units. These components constitute the core of industrial laser systems for scanning of printed codes, marking of textiles and surfaces, welding of sheet metal and plastics as well as for the cutting and drilling of semiconductor wafers and numerous other materials like metals, plastics, or glass. Furthermore, RAYLASE develops and manufactures a series of different modules and solutions for the integration in devices and machines.

www.raylase.de

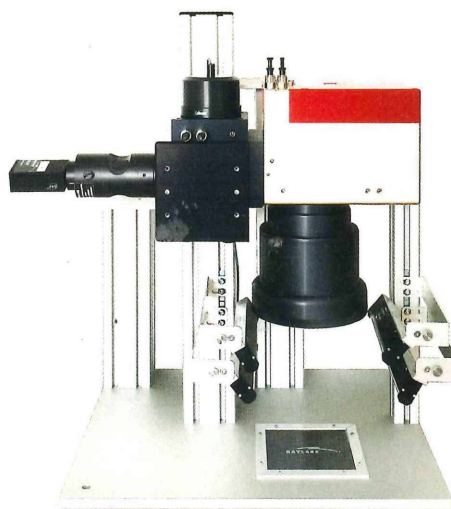


Fig. 1 On-axis machine vision control – combining a laser deflection unit with a camera coupled into the path of the laser beam

large degree. Unfortunately, this positioning is extremely complicated from a mechanical point of view, as well as costly. If various types of parts are to be processed in a laser system, the laser system will need to be integrated into production control at a deep level.

Raylase has set itself the goal of making it easy for manufacturers, integrators, plant manufacturers, and researchers to take advantage of the powerful properties of lasers. The company offers high-precision components for fast deflection and modulation of laser beams, as well as functional assemblies and solutions for laser processing. One of its latest innovations has been to combine a laser deflection unit with industrial cameras and special machine vision software (see Fig. 1).

Modern machine vision – universal, accurate and reliable

Raylase has developed Machine Vision Control (MVC), which enhances conventional laser deflection units with the functions that are made possible by modern machine vision. Laser systems

based on MVC can optically inspect parts, identify the type of each part, and allow parts to be placed in virtually any position in the laser field. This increases precision, speed and integration capabilities, while significantly reducing the costs associated with laser systems. In recent years, machine vision has established itself as an enabling technology in industrial manufacturing. High-precision quality inspection, contact-free measurement and process control based on optical image analysis make this technology ground-breaking in the area of manufacturing automation. The most frequently cited benefits are increased safety, traceability, the saving of materials and improved quality combined with greater resource efficiency and productivity.

In the laser process, optical measuring technology in conjunction with industrial cameras and software algorithms enable positioning and rotation of the laser relative to the part with micrometer precision. As a result, only a simple mechanism is required to place the parts in the laser field. The machine vision unit also offers native optical