Optical measurement systems: advancement of superior test and measurement

Conventional measuring processes are becoming obsolete as they do not offer the required accuracy, are prone to errors and time-intensive. As opposed to that, optical sensor technology and laser-based test and measurement systems are faster while providing more accuracy and flexibility—and conserve energy.

Today’s automated manufacturing processes have become so fast that they can no longer be ascertained by the human eye. Conventional measuring processes do not support this speed, creating a demand for an alternative to mechanical methods.

Optical measurement systems: groundbreaking future-ready control methods

However, the use of optical test and measurement systems is no longer limited to industrial production processes. The speed, flexibility and precision of optical sensors is successfully used in various application areas outside of industrial manufacturing processes as well:

- **In monitoring applications for industrial production**, optoelectronic processes have become essential: As opposed to conventional methods, these high-precision measuring processes are capable of lowering costs without compromising quality while enabling ecologically sustainable operations.
- **Architecture and design** utilize the precision of laser-based measuring techniques to ascertain areas in order to optimize shapes or to achieve maximum precision in reverse engineering (making precise copies of a given object).
- **Criminalistics** uses laser scanning for measuring and mapping crime scenes to create 3D models, enabling contactless search for evidence through measuring probes and hence avoiding compromised traces or pieces of evidence.
In **forensics**, stripe light projection is used as a measuring and testing system enabling precise spatial and dimensional reconstruction as well as digital reproduction of injuries.

Various **natural sciences** use optical analytical methods due to their excellent measuring capabilities for fast mapping and precise analysis of surfaces and motions.

**Optical sensors and laser-based test and measurement systems** have proven to be game changers in this scenario. Due to their superior measuring speed, they enable **more efficient manufacturing methods** that would not have been possible using conventional methods. This **cost and energy saving technique** benefits both companies and the environment.

Optical sensors are also integrated in **agriculture** applications to achieve an ideal ratio of sustainability and efficiency. Farmer Stephan Nunner uses them for fertilizing and tilling fields; in the following video he explains why he sees no alternative to optical processes:

Optical sensor systems and laser-based test and measurement systems have evolved into indispensable instruments in various fields. The latest developments in research and production indicate an ongoing expansion of application areas for optical test and measurement systems.

**Focus topic**

- Segment flyer sensors, test and measurement and optical measurement systems (1.5 MB PDF-document)

⇒ All focus topics at LASER World of PHOTONICS 2019

**Exhibitor directory**

⇒ Alle Aussteller aus den Bereichen Sensorik, Mess-und Prüftechnik auf der LASER World of PHOTONICS 2017

⇒ All exhibitors in the area of sensors, test and measurement and optical measurement systems at LASER World of PHOTONICS 2017
The **LASER World of PHOTONICS product index** (PDF, 296 KB) is a helpful range of exhibits according to product groups covering, among others, the following areas:

- Optical sensors
- Laser-based test and measurement systems
- Test and counter systems
- Measurement techniques and instruments

At LASER World of PHOTONICS 2019, interested visitors have a rare opportunity to tap into the technical competency of industry and research representatives and to benefit from in-depth information on the latest developments, products and technologies used in optical test and measurement systems. The presence of leading experts and global key players also provides an opportunity to establish contacts for valuable business relationships.