



Press Release

Sensor+Test: TRUMPF presents industrial-grade VCSEL lasers for precise optical sensing

Smart VCSEL lasers to support optical sensors in industrial environments // Single-mode VCSEL portfolio available in robust TO packaging // New polarization-controlled features for higher illumination quality // Measuring air quality in real-time showcased in live demonstrations

Ulm, April 18, 2023 – TRUMPF Photonic Components, a global leader in VCSEL and photodiode solutions for industrial and consumer sensing is showcasing two live demonstrations to show the performance of the single-mode VCSEL solutions at Sensor+Test (Booth 1-156) in Nuremberg, Germany. The sensing components based on VCSEL technology are compact and robust laser sources, supporting industrial optical sensing systems. “Many industrial applications benefit from the continuous innovations in VCSEL technology,” says Ralph Gudde, Vice President of Marketing and Sales at TRUMPF Photonic Components. “Our approach is to make our VCSEL solutions more rugged and smarter by integrating additional functionalities and in so doing to address the high demands of our customers and to enable new applications” Gudde adds.

One live demonstration will highlight the capabilities for gas sensing in the 760 nm to 766 nm wavelength range. The second will show the precise measurement of particulate matter concentration in the air. The solutions are based on innovative VCSEL technology, such as VCSELs with integrated photodiodes (ViP). These VCSELs not only emit light, but also detect back-scattered light and therefore allow the self-mixing interference measurement method (SMI). Applications such as optical encoders for speed and distance measurements or particle sensors benefit from this technology. TRUMPF provides customers the option to assess the technical capabilities of the SMI and ViP technology for industrial sensing applications by offering an evaluation board.

Application variety: from gas to speed to particle sensing

Whether oxygen sensing in laboratory and industrial environments, speed and distance measurements in industrial process lines or particulate matter measurements in IoT and indoor applications, all kinds of optical sensor systems

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rely on VCSEL as laser sources, as they are highly efficient and insensitive to dirt and sunlight. Additionally, the contactless measurement solution is maintenance-free which supports applications in harsh industrial environments. Easy and safe handling is supported by TRUMPF not only in the offering of components or VCSEL in TO cans, but also in the further customization with the integrating of driver electronics or special optics. This is enabled by in-house, state-of-the-art assembly processes.

New VCSEL for higher illumination quality

Single-mode VCSEL light sources offer excellent and reliable performance and are available with wavelengths ranging from 760 nm to 940 nm. For even higher illumination quality, TRUMPF offers solutions with polarization control. Later in 2023, TRUMPF will expand its portfolio of polarized VCSELs and release a large polarization-controlled, single-emitter, single-mode VCSEL component with 2 mW output power. This will serve applications like industrial optical encoders and spectroscopy. Evaluation samples will be available from June onwards and mass production is scheduled for the end of 2023.

Visit TRUMPF Photonic Components at Sensor+Test 2023 at Booth 1-156

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VCSEL in TO packaging for industrial environments

VCSEL in TO packages can come with integrated temperature control and offer easy handling and precise control.



State-of-the-art clean room facility of TRUMPF

TRUMPF designs and manufactures its VCSEL solutions in a high-tech facility in Ulm, Germany.



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Gas sensing with 760 – 766 nm single-mode VCSELs

Real-time analysis with contactless measurement based on VCSEL technology, for fast-response and accurate measurement.

About TRUMPF Photonic Components

TRUMPF Photonic Components is a global technology leader, supplying VCSEL and photodiode solutions for consumer electronics, datacom, automotive, industrial sensing and heating markets. So far, more than two billion VCSEL chips and photodiodes have been shipped worldwide. The staff continues to drive its technological know-how, that has been established for over 20 years now in order to maintain its leadership position. The long-established technology was acquired by TRUMPF in 2019. The company has its headquarters in Ulm, Germany, with further sales locations in the Netherlands, China, Korea and the US.

TRUMPF Photonic Components belongs to the TRUMPF Group, a high-technology company that offers production solutions in the machine tool and laser sectors.

TRUMPF is one of the world's technological and market leaders for machine tools used in flexible sheet metal processing, and also for industrial lasers and metal 3D printing. In the 2021/22 fiscal year, the company employed some 16,500 people and generated sales of about 4.2 billion euros. With over 80 subsidiaries, the TRUMPF Group is represented in nearly every European country, in North America, South America and Asia. The company has production facilities in Germany, France, the United Kingdom, Italy, Austria, Switzerland, Poland, the Czech Republic, the United States, Mexico and China.

For more information about TRUMPF Photonic Components visit:

www.trumpf.com/s/VCSEL-solutions

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