

PRESS RELEASE

Next Stage of OCT for Remote Laser Welding

Photonics research project targeting flexible, networked manufacturing

Garching, Germany – December 18, 2017 – As the technology leader for intelligent laser welding solutions, Blackbird Robotersysteme GmbH is participating in a research project that intensively explores optical coherence tomography's potential for remote laser welding in auto manufacturing. The Technical University of Munich's Institute for Machine Tools and Industrial Management (iwmb), together with multiple industrial partners such as BMW and OCT sensor maker Precitec, are investigating innovative technology for more flexibility in body construction, particularly electro mobility. Germany's Federal Ministry of Education and Research sponsors the project under the 'Photonics Research Germany' research incentive program.



The German government's clear goal is to advance electromobility. A look at the causes of very disappointing electric vehicle sales to date shows for example inflexible production structures which do not allow cost-efficient manufacturing of smaller volumes. Future-proof production systems and bonding techniques need to work flexibly, adaptively and with connectivity. To maximize efficiency and autonomy,

machines will require much more information about their surroundings and the objects to-be-processed. This is precisely where contactless methods such as OCT, combined with photonic sensors, offer tremendous potential for detecting orientation and status, assessing process results, and sharing and documenting this information within the manufacturing process.

Further development of these industrial advantages is the goal of the research initiative 'Photonics for Flexible, Networked Production' and particularly the research project 'Robot-Supported, Scanner-Based Optical Coherence Tomography in Remote Laser Welding for Process Chain Flexibility in Body Construction' (RoKtoLas). Project partners BMW AG, Blackbird Robotersysteme GmbH, Precitec GmbH & Co. KG, Emil Bucher GmbH & Co. KG, applicationtechnology GmbH & Co. KG and the Technical University of Munich's iwmb are seeking an innovation leap through alternative bonding technology for raw body construction. The research project is sponsored by Germany's Federal Ministry of Education and Research under funding code 13N14551 and supported by the VDI Technology Center.

Weld seam analysis for more efficiency in production

The project utilizes a Blackbird scan solution consisting of an intelliWELD PR scan head from affiliated company SCANLAB, a ScanControlUnit and an OCT scanner. The

integrated OCT technology employs single-point high-speed distance measurement based on interferometry. Imaging relies on ultra-fast workpiece scanning with a dedicated OCT scanner coaxially coupled in the weld scanner. This welding solution thus provides integrated edge tracking and seam topology measurement. Unlike other measurement methods, OCT-based distance measuring can acquire and evaluate detailed data with full flexibility ahead of, within and past the actual laser process zone. This includes, for example, individual analysis of the to-be-welded components and seam tracking of fillet welds, as well as exact detection and parameterization of potential weld defects or imprecision during the weld process. Such data allows assessment of seam quality as well as detection and recording of defects such as inadequate width, penetration, open pores and faulty positioning. This data can be used in a clock-period-neutral manner for quality assurance procedures that eliminate the need for downstream quality assurance steps.

"It's conceivable the future will offer numerous additional application possibilities – even reaching beyond the auto industry." explains Dr. Ulrich Munzert, Chief Technology Officer at Blackbird Robotersysteme GmbH, regarding the OCT method. "In light of the automotive sector's demanding requirements, this research project now allows us to accumulate practical experience on simplifying manufacturing approaches and processes while weighing them against alternatives."

Print-quality images can be downloaded at

<http://www.blackbird-robotics.de/en/trade-shows-news/press-releases.html>.



About Blackbird Robotersysteme:

Blackbird Robotersysteme GmbH manufactures system solutions for remote laser welding with scanning optics. The mirror-based beam deflection units can be integrated seamlessly into industrial manufacturing systems, particularly robot cells. The company's core competency is the development of powerful control technology and intuitive user software. Combined with 2D and 3D scan systems of the affiliated company SCANLAB, Blackbird offers machine and system builders a broad range of highly efficient pre-integrated solutions for high-volume production in the automotive industry and numerous other manufacturing sectors.

About SCANLAB:

With over 30,000 systems produced annually, SCANLAB GmbH is the world-leading and independent OEM manufacturer of scan solutions for deflecting and positioning laser beams in three dimensions. Its exceptionally fast and precise high-performance galvanometer scanners, scan heads and scan systems find application in industrial materials processing and the electronics, food and beverage industries, as well as biotech and medical technology.



For over 25 years, SCANLAB has secured its international technology leadership through pioneering developments in electronics, mechanics, optics and software, as well as the highest quality standards.

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