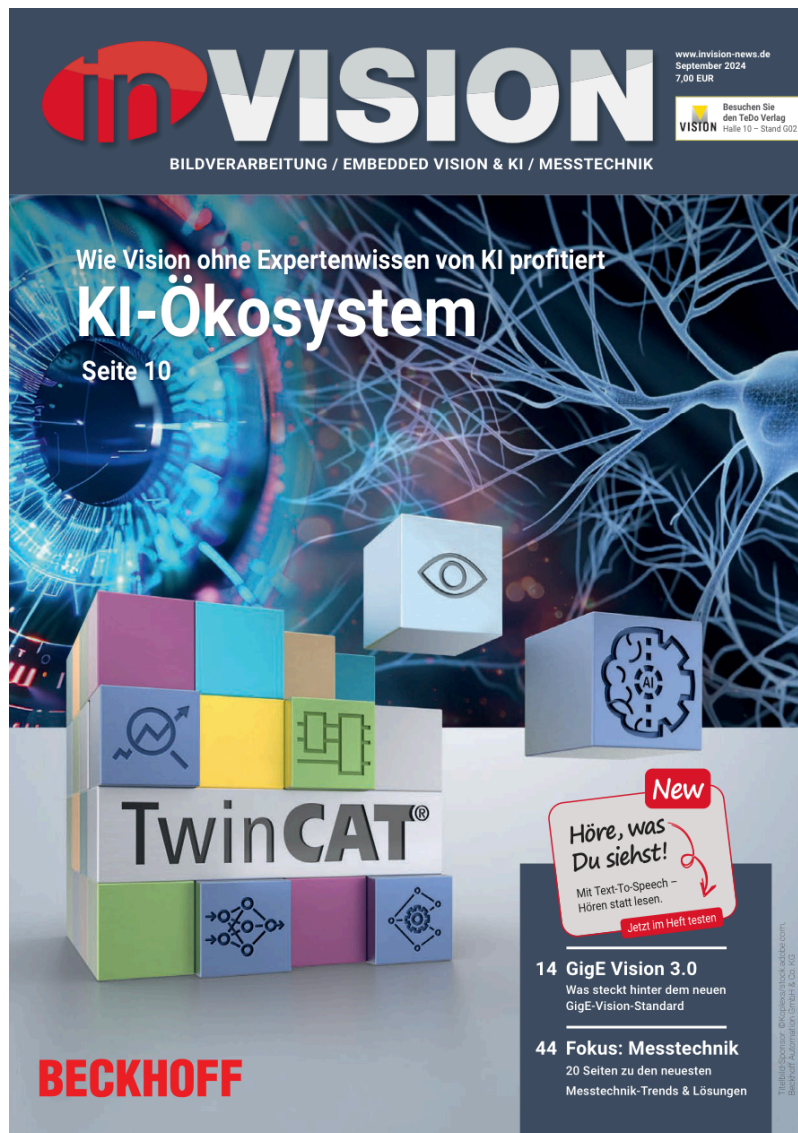


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UNOFFICIAL ENGLISH TRANSLATION

The original article was published in German in inVISION, a trade magazine published in Germany. Prepared for CRETEC. The German original remains the reference.



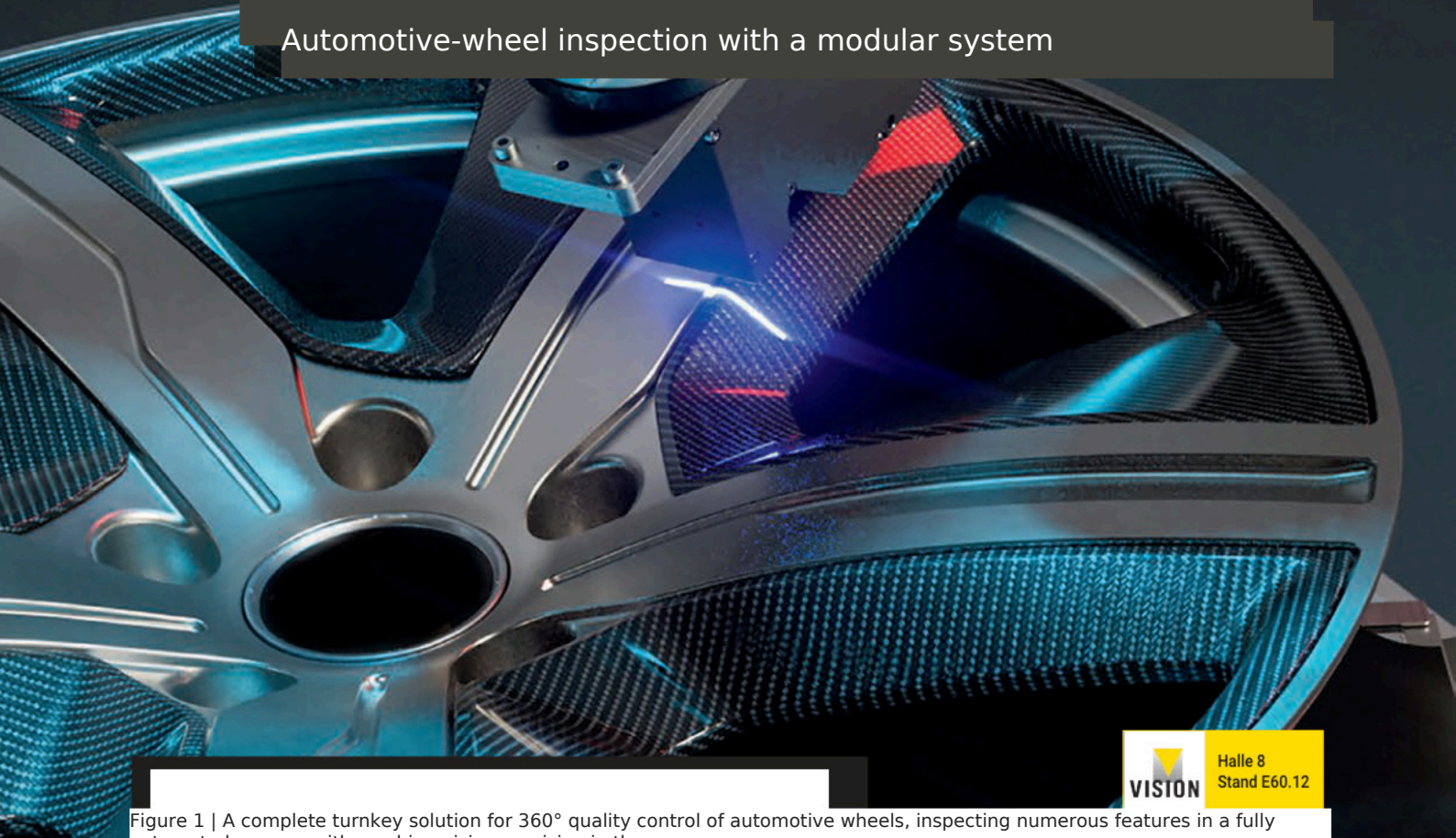
Perfect appearance

The adjacent publisher app advertisement remains in German. Original publisher artwork, logos and advertisements are retained in their original language.



Perfect appearance

Automotive-wheel inspection with a modular system



Halle 8
Stand E60.12

Figure 1 | A complete turnkey solution for 360° quality control of automotive wheels, inspecting numerous features in a fully automated process with machine-vision precision in the μm range.

Author: Kamillo Weiss, freelance journalist | Images: Cretec GmbH

A premium car manufacturer uses Cretec's modular QBIC vision platform to check the exact centring, rotational position and type of aluminium wheels within one minute.

In the premium automotive segment, perfect appearance is an important part of a brand's image and marketing. Components therefore require the highest precision, and no visible surface defects may spoil their flawless appearance. Here, perfection in quality control is guaranteed only through 3D machine vision.

The feasibility study for the automotive company used a 3D image scan to detect defects unequivocally at numerous measuring points relating to the precise positioning of plastic blades fitted into aluminium wheels. The 3D vision system had to provide measured evidence that every blade met the specified permissible gap and height difference relative to the aluminium surface. Alongside a more elaborate inline solution, the compact QBIC platform offered, as a stand-alone flexible system, convincing technological and economic advantages for industrial series production.

Each wheel is placed manually or automatically in the vision system's

drawer and moved into the measuring position. From above, a 20 MP camera records the wheel's exact centring, rotational position and type with an inspection accuracy of 0.3 to 0.15 mm. This also documents its flawless condition. A six-axis robot moves the 3D camera measuring head to the respective inspection positions.

10 μm accuracy per point in all three dimensions

Cretec's measuring concept, patented for both inline and offline use, guarantees an accuracy per measuring point of less than 10 μm in all three dimensions during wheel inspection. MSA measurement accuracy is better than 100 μm . This ensures very high accuracy and



Figure 2 | In the flexible QBIC modules, control, data analysis and communication are linked directly into an autonomous system.

vision system provides excellent access from all sides and great flexibility in designing particularly compact, mobile solutions. Depending on the version, the complete QBIC module requires a footprint of only 0.8 m x 0.8 m or 1.2 m x 1.2 m, with a maximum height of 2 m. Integrated retractable wheels allow it to be moved quickly for delivery or relocation and connected to other QBIC units.

The complete solution automates many vision tasks simultaneously. Integration options include electrical equipment, controls, an industrial PC, cameras, the VisionTube code verifier, a cobot or robot, different vision modules, intelligent lighting, a large touchscreen monitor, Industry 4.0 communication modules (OPC UA, IOTA) and neural networks. A mains-independent power supply maintains operation even during a power failure and also permits relocation while the system is operating.

flexibility, because each inspection feature can be adjusted individually at any time. The cycle time for a complete wheel inspection in QBIC is less than one minute.

Using the vision system, a wheel could already be inspected with around 50% less time during the feasibility study. Further time savings resulted from final project implementation and faster installation and integration into production. In the event of a complaint, the documentation provides the measuring-point data, all measured values and every wheel type.

Versatility in a minimal space

The mobile platform with its minimal footprint and modular hardware and software ensures exceptional flexibility for complete vision-system solutions. This shortens project development, installation and adaptation to new product variants. Versatile QBIC modules, each with a broad range of capabilities, are linked directly into an autonomous system through control, data analysis and communication.

The hexagonal design of the Cretec

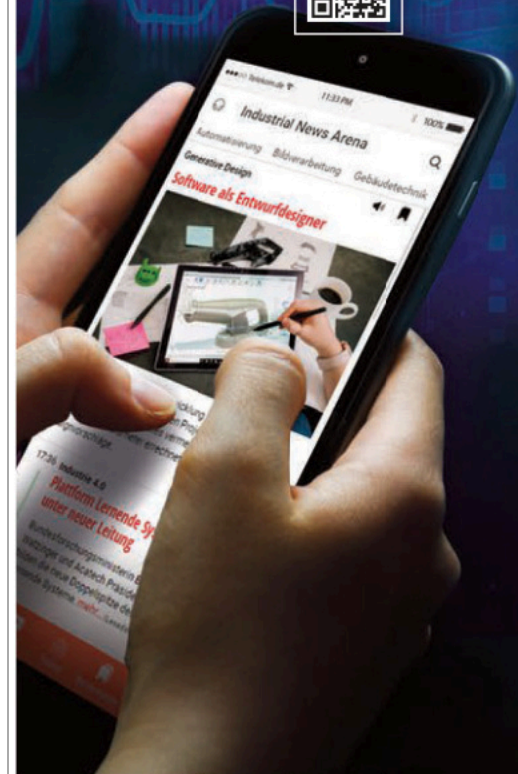
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