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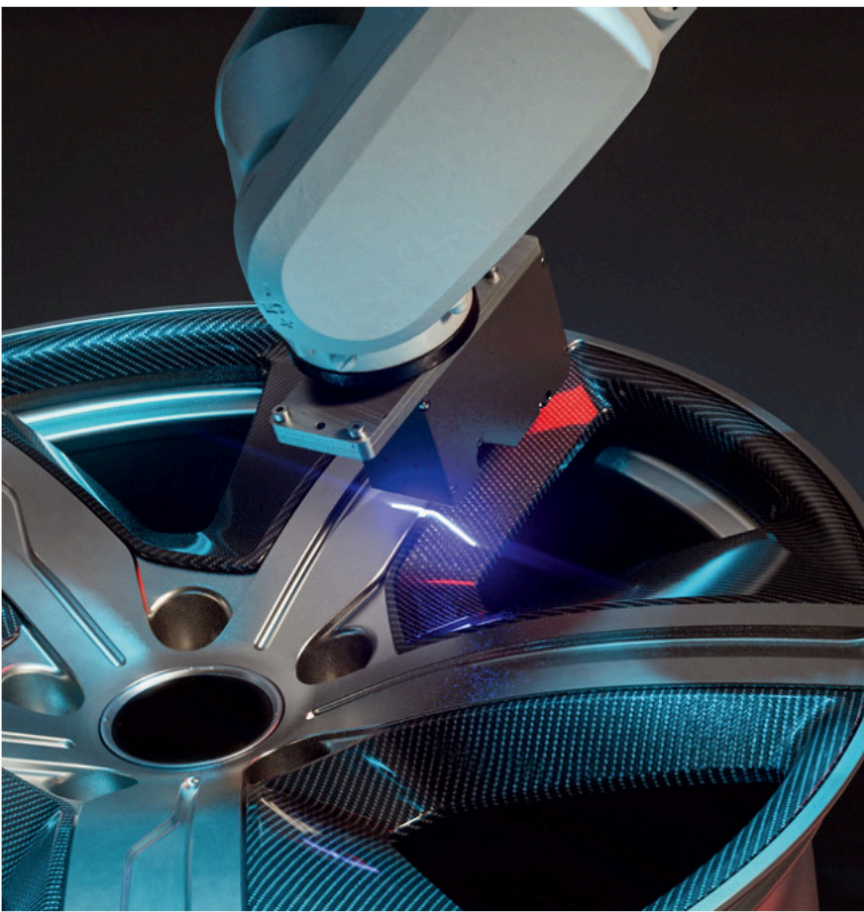
Flawless automotive wheels

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Vision platform

Flawless automotive wheels

Cretec's modular QBIC vision platform combines consistent synergies between networked, scalable, complete vision solutions. It enables high-precision inline or offline applications with modular hardware and software in a minimal space. A practical test of 360° automotive-wheel inspection demonstrates its strengths.



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. © Cretec

For users in many industries, QBIC (Quality Inspection Cubicles) is a universal inspection-cell concept. From a technological and economic feasibility study, through the entire product value chain, it offers automated quality assurance with the highest precision and documentation for perfect traceability.

Flawless automotive wheels

In the premium automotive segment, a perfect appearance is a very important part of brand image and marketing. Buyers can be extremely exacting. Components must therefore be highly precise, while no visible surface defects may spoil their flawless appearance. The human eye can easily overlook something when

lighting conditions vary slightly. Here, perfection in quality control is guaranteed only by high-performance 3D machine vision.

Unequivocal defect detection

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.

Documenting condition

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.

Patented measuring concept with 10 μm accuracy

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 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 QBIC as early as the feasibility study allowed the study to be completed with around 50% less time. Further time savings came from faster final project implementation and quicker, simpler installation and integration into production. Accelerated project delivery also proved to be an important economic factor. In the event of a complaint, the documentation provides the measuring-point data, all measured values and every wheel type. This supplies evidence that the wheel was in flawless condition when delivered.

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 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 × 0.8 m or 1.2 m × 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 economically and sustainably automates numerous vision tasks simultaneously in a minimal space. Integration options include electrical equipment, controls, a high-performance PC, cameras, the VisionTube code verifier, a cobot or robot, different vision modules, intelligent lighting, a large touchscreen monitor and Industry 4.0 communication modules, from OPC UA to IOTA. Neural networks can also be integrated.

A mains-independent power supply maintains operation even during a power failure, preventing data loss. It even allows the system to be relocated while operating. Integrated high-performance PCs also make these solutions suitable for demanding artificial-intelligence tasks using deep learning.

Complete QBIC solutions cover a broad range of applications:



Versatile QBIC modules form a highly flexible complete solution with a broad range of capabilities. Control, data analysis and communication are linked directly into an autonomous system. © Cretec

pick-and-place, registration and classification tasks, ID codes, inspection, 2D and 3D measurement, surface inspection, decision-making and sorting processes.

According to its own statements, Cretec currently provides the only ISO-certified experts in industrial machine vision in Europe.

Integrated retractable wheels simplify delivery and allow the complete QBIC module to be relocated quickly at the user's site. © Cretec



Company profile

Cretec, based in Büdingen, develops, manufactures and sells industrial machine-vision modules and complete solutions, code-reading systems, intelligent LED lighting, cobot/robot vision and integrated artificial-intelligence algorithms. A particular focus is networked digital communication on Industry 4.0 platforms, from OPC UA to the IOTA communication protocol. Compact construction, powerful hardware and software and robustness in harsh industrial environments characterise the solutions.

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