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**Triangulation, stereometry and phase shifting – combined 3D sensor delivers reliable results with shortest cycle times**

## **Highly flexible and reliable – New 3D sensor uses shape measurement for high-precision quality control**

Measuring edges, hole dimensions, flushness, gaps – with a combination of different measurement methods and 3D point cloud technology, a new 3D sensor has become a universal solution for a wide range of measurement tasks. Combined with 3D robot guidance and 3D inline measurement technology, the sensor is ideal for performing completeness checks and quality control on automated production lines. Thanks to tailored software packages, the sensor ensures reliable results in all applications with short cycle times.

Inspecting a plane surface for bumps and indentations, measuring the diameter of an orifice or capturing a free-form surface for CAD data matching are all diverse tasks that can arise during the inspection of deep-drawn sheets or injection-molded parts. With its combination of stereometry, triangulation and phase-shift lighting, the newest generation of the “Area Profile Scanner 3D” can be used wherever object geometries need to be measured accurately at high speed. The 3D sensor thus ensures reliable quality assurance on highly automated production lines and can be used both for inspecting incoming materials as well as for output control. Thanks to the precise measurement of free-form surfaces, the 3D sensor provides fast results with accuracy in the range of a few micrometers – even when

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measuring large surfaces. It is available in different variants, with measuring fields of up to 460 x 360 mm<sup>2</sup>.

### **From point clouds to object measurement and quality inspection**

Thanks to its stereometric two-camera set-up, the APS3D uses triangulation to calculate the surface of a test object with the highest precision in three dimensions. The sensor uses random pattern or phase-shift lighting. Random pattern lighting sends the sensor the necessary points of reference in a single image, significantly speeding up scanning times and considerably shortening cycle times. Object detection and quality inspection can also be done "on the fly" with moving objects and without motion blur – resulting in minimum cycle times. The collected data is shown in a point cloud and can be exported for CAD data matching. Thanks to the integrated PC, the data can also be exported in STL format. All three-dimensional characteristics are detected and work steps can be performed without any additional measurements. Through automated meshing, where the individual 3D data points are connected to one another in a triangular shape to form a network, the sensor is able to digitally map complex surfaces. This produces a cohesive model that can be forwarded to a 3D printer for example. Based on geometric relations, the APS3D checks the quality of surfaces, the correct size of boreholes and the correct spatial relationships between object features within one scan. The Windows operating system, the intuitive user interface and menu guidance, and the multi-touch navigation are easy to use. The sensor can be deployed as a stand-alone solution, integrated into the production line or mounted on a robot, and is compatible with all conventional Ethernet and fieldbus interfaces.

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### Maximum flexibility thanks to “Touch & Automate”

Application-specific software modules, including measurement parameters for new tasks or service tasks such as maintenance, mean that the sensor is highly adaptable and flexible. The Plug & Automate concept allows for quick commissioning. As part of the “Touch & Automate” automation concept, the APS3D is equipped with Wi-Fi capability to communicate with other sensors and with a shared database. The systems used within this sensor network are able to communicate to fulfill larger measurement tasks. The aggregated data can be used directly for process analysis. Using a higher-level quality and yield management software, operators can directly access the collected data for use in reports and analysis. Thanks to its versatile technical features and customized software packages, the APS3D covers 3D robot guidance as well as 3D inline measurements. Its flexibility, connectivity and adaptability make the 3D sensor an ideal component for enabling networked industrial production and INDUSTRY 4.0.

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### Images



657\_1.jpg

APS3D captures complex surfaces down to the very last detail.



657\_2.jpg

By measuring the shape of an object, all features are checked simultaneously without an additional scan.

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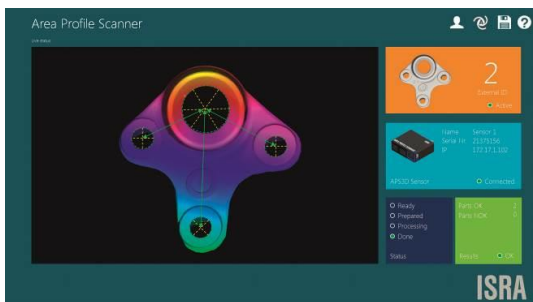
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657\_3.jpg

APS3D also scans moving objects “on-the-fly”, making it suitable for highly-automated production lines.



657\_4.jpg

Intuitive and clear multi-touch controls allow for safe operation without prior knowledge.

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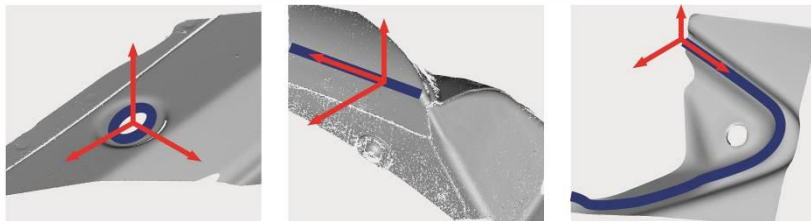
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657\_5.jpg

APS3D captures objects using random pattern or phase-shift lighting – depending on the task at hand. The sensor can be customized to perform various tasks by means of tailored software packages.



657\_6.jpg

Measuring edges, hole dimensions, flushness or gaps – APS3D's combination of stereometry, triangulation and phase-shift lighting offers an all-in-one solution for a variety of measuring tasks.

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