Flexible, reliable, precise – new 3D sensor supports short cycle times with high-speed calculation of point cloud

The high-tech double package:
3D sensor technology for robot guidance and form measurement

Robot guidance and quality assurance – The new generation of a high performance sensor is adapting flexibly to these challenges: The new sensor offers suitable solutions for 3D robot guidance and 3D inline measurement at the same time thanks to tailored software packages. Through a pioneering mix of different measurement methods and point cloud technology the all-around system delivers reliable results and short cycle times in both applications.

Next to a combination of stereometry, triangulation and phase-shift lighting, the newest generation of the “Area Profile Scanner 3D” provides enormous flexibility. With this individualized software layout, the 3D sensor is tailored for two different applications and can be used where complex geometry of objects must be measured with high-speed or when a fast robot vision with shortest cycle times is needed. Users receive the exact features of the sensor suitable for their needs – the versatile Area Profile Scanner APS3D is configured to efficiently realize both.

From a point cloud to measuring objects and guiding robots

Thanks to its stereometrical composition with two cameras, the APS3D is able to calculate the surfaces of an object with highest precision three dimensionally using triangulation. For illumination 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 the scanning time and allowing a reduced cycle time in robotic usage in particular, such as in the positioning of glued beads. Object capturing and quality control also work “on the fly”,

with moving objects and without a motion blur. This opens up a giant variety of possible tasks: checking a plane surface for bulges and bumps, controlling the diameter of holes or capturing a free form surface in three dimensions, all while fulfilling short cycle times.

The collected data is shown in a point cloud and can be exported for CAD data matching. Thanks to the on-board PC, they also can be exported as STL data. All three-dimensional characteristics are noticed and working tasks can be realized without measurement. 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 picture a surface. This produces a cohesive model, which can be forwarded to a 3D printer for example. With the help of geometric shapes the APS3D checks the quality of surfaces, the correct sizes of boreholes and the relations between object features within one scan. The windows operating system, an intuitive software and user menu, as well as 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 to all common Ethernet and fieldbus interfaces.

Maximum flexibility through „Touch & Automate“

Being a part of the “Touch & Automate” portfolio, the APS3D will be equipped with WLAN to communicate with other sensors and with a shared database. Within this sensor network, the installed systems are able to communicate to fulfill larger measurement tasks. The aggregated data can be used directly for process analyses. Using a subordinate quality and yield management software, operators can access the collected data for reports and analysis. Through its well-rounded technical equipment and the individualized software packages the APS3D covers 3D robot guidance as well as 3D inline measurement. With its flexibility and connectivity the 3D sensor will be an adaptive component to serve the needs of networked industrial production and INDUSTRIE 4.0.
APS3D captures complex surfaces including every detail.
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Through form capturing, all features are checked simultaneously without an additional scan.
APS3D scans „on-the-fly“, and is therefore suitable for highly automated production lines.
Intuitive multi-touch-operation allows for safe operation without prior knowledge.

APS3D captures objects using random pattern or phase shift illumination – just as needed for the task at hand. The sensor adapts to individual tasks through tailored software packages.
Measuring edges, holes, gaps or flushness – with its combination of stereometry, triangulation and phase shifting illumination APS3D offers a solution for a large variety of tasks.