Multi-camera configuration combined with 3D precision measurement technology makes checking coordinates in the inspection lab a thing of the past

**Increase precision while reducing the need for calibration – with the dual-sensor system for exact 3D inline measurement**

A new dual-sensor system for correlation-free gauging in automated production now eliminates the need for coordinate measuring equipment. High-resolution cameras mounted directly in the respective production cells determine the exact position of the robot within a higher-level coordinate system. Therefore, measurements remain absolutely precise, even in the event of material changes in robots caused by thermal effects.

The higher-level multi-camera system determines the spatial position of the robot and a mounted sensor in all six degrees of freedom. This significantly raises measuring precision and eliminates the typical drawback of industrial robots – their inability to maintain a high level of measuring and movement precision in continuous operation – of all makers and types.

**Absolute measurement reduces need for recalibration**

The absolute inline measurement makes the deployment of industrial measuring robots far simpler and more flexible. Even in challenging production environments, the robust measuring system can be set up
quickly and easily. The paths of the arms can be programmed offline without having to take any special conditions into account. The absolute position of the sensor and robot is captured in less than a second, significantly reducing the number of recalibrations needed. Since the super ordinated coordinate system immediately determines position deviations, the recorded results remain absolutely precise even in the event of changes. Recalibration through correlation is therefore no longer necessary, therefore effectively lowering costs. The measurements are performed using a compact version of ISRA’s X-GAGE3D. The multi-stereo sensor equipped with four cameras and high-performance LED lighting delivers precise 3D scans of objects for direct CAD comparison. By completely digitizing objects, it allows all spatial characteristics to be checked with just one scan, significantly speeding up quality control. Moreover, thanks to the absolute measurement methodology, the results obtained through X-GAGE3D retain their accuracy.

Independent of temperatures thanks to carbon frame

Several high-resolution cameras are used in each robot cell, thereby ensuring the exact determination of the sensor head, even if the robot arm covers the sensor in the field of view of an individual camera. Since the system is mounted on a temperature-resistant frame made of a carbon-fiber composite material, environmental influences on the measurements are reduced to a minimum. Furthermore, users can completely forgo the inspection of components or car bodies in a coordinate measuring machine and, in particular, the time-consuming transport to the inspection lab.
Absolute precision: Ready for INDUSTRY 4.0

Already today, optical systems are a key technology for networked production and the “smart factory” of the future. As central data hubs that generate detailed production data in addition to using it themselves – such as for process adjustments – they make an important contribution to an adaptable production process. Due to absolutely precise inline measurement technology, this will be an even more important factor in the future, as these superordinate optical systems will be able to control robots and sensors directly and with optimum precision.

Image

Mounted on a temperature-independent frame, multiple cameras capture the entire operating range of the industrial robot.