

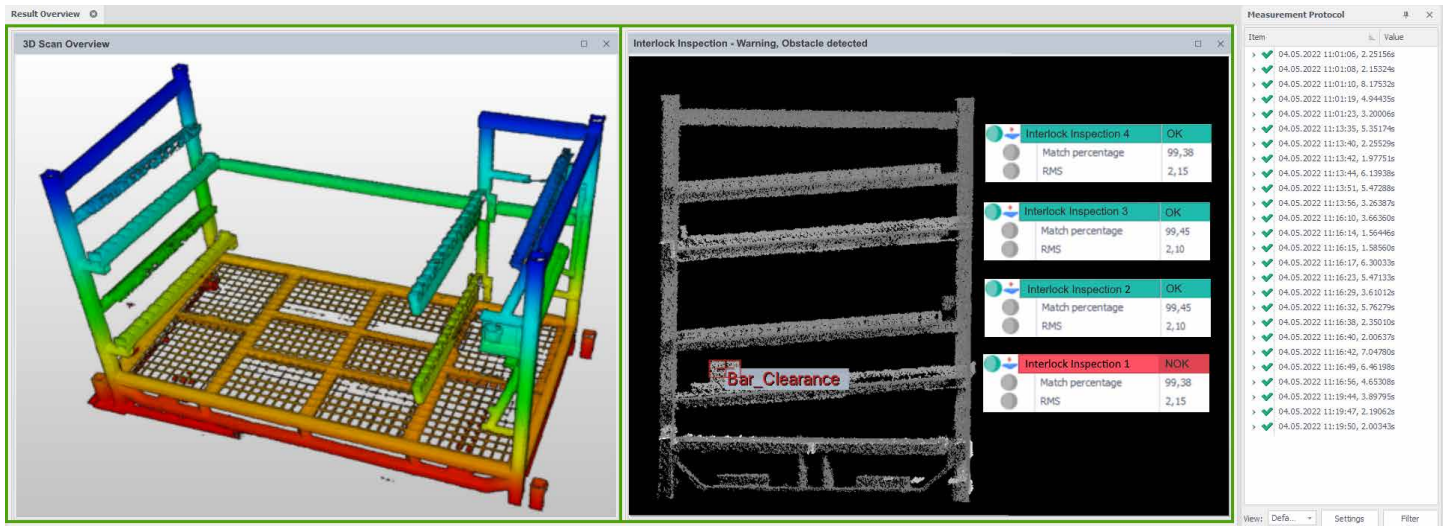
3D robot guidance for intelligent container inspection

Stacking of pressed parts with VMT FrameSense



Container Management - Positioning and Condition Monitoring

VMT FrameSense is a static 3D measurement system specifically designed for the type, shape, and position inspection of containers, as well as the automated stacking of finished parts using robots. It fulfills all process and operational requirements in press shops.



Precise measurement with high-resolution 3D sensors

VMT FrameSense utilizes high-resolution 3D sensors from the VMT DeepScan sensor family, along with intelligent aggregation and evaluation algorithms provided by the VMT software platform MSS (Multi Sensor System). These technologies enable the system to accurately measure various degrees of freedom, such as position and orientation, variations in shape and geometry, the condition of attachments and fastenings, as well as the presence of interfering edges and contours.

Detection of container types and sizes

VMT FrameSense is capable of identifying different types and sizes of containers. This ensures that the stacking robot can handle and precisely position the finished parts from the press shop reliably and without errors, down to the millimeter level.

Highlights

- **Process reliability with high-resolution 3D sensors**
- **Position determination: High-precision positioning of relevant subareas**
- **Collision prevention: Prevents collisions with closed latches or occupied containers**
- **Lifecycle Management: Monitors condition, quality, and geometry**
- **Flexibility of system design**

VMT FrameSense

Process and fail-safe

Securing the production process

VMT FrameSense contributes to a reliable production process through precise 3D positioning of containers, monitoring of fastenings, and collision avoidance with interfering edges and contours. Additionally, the 3D measurement data can be used for quality and geometry control of the containers and their lifecycle management.

User-friendly operation

Setup, operation, maintenance, recalibration after sensor replacement, and configuration of new components can be easily performed by the operating personnel. As the measurement solution does not rely on moving components, it ensures maximum robustness and accuracy.

Verification of the acquired data

To differentiate containers and measure their position and geometry, VMT FrameSense employs a form-based probing method. Instead of examining individual features such as edges, the system captures the entire geometric outer contour of the component. Surface geometry is captured using 3D sensing, where millions of individual 3D points are merged into a point cloud.

Hardware system architecture

The hardware system architecture of VMT FrameSense consists of high-resolution 3D camera sensors with integrated field illumination, whose measurement data ensures the required imaging quality of the containers. Calibration, data fusion, and evaluation are performed in a dedicated IPC with screen visualization, control elements, and integration with the robot controller. The software underlying the measurement solution is based on the VMT software platform MSS. It is freely configurable and continuously expanded with new algorithms, evaluation methods, and applications.

Additional advantages of VMT FrameSense

In addition to the mentioned features, VMT FrameSense offers many other advantages. The easy and accurate calibration using spheres or plates, the use of integration-friendly 3D sensors instead of individual cameras, brightness and color-independent measurement technology, the elimination of external lighting, and the possibility of virtual commissioning are just a few of the fundamental advantages.

VMT FrameSense is capable of reliably addressing the challenges of robot-assisted stacking of finished parts in automotive plants, thereby contributing to a secure production process.



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