

VMT™ Vision solutions for logistics

- Depalletizing with VMT™ DeStack
- Bin-Picking with VMT™ PickFinder
- Press Part Handling with VMT™ FrameSense



Depalettizing with VMT™ DeStack



The primary application area for the VMT™ DeStack depalletizing system is in logistics, where it is specifically used for the efficient unpacking and handling of pallets.

The requirements for such a depalletizing system can be summarized simply: the pallet should be unpacked as quickly and accurately as possible. This is linked to various conditions that are met by the VMT™ DeStack.

VMT DeStack meets complex depalletizing requirements

The VMT DeStack depalletizing system identifies various box types without requiring prior type specification and operates with high positional accuracy of ± 1 mm. Boxes are destacked in a customizable sequence, from front to back and top to bottom. The system is designed to work with a fast cycle time of under ten seconds, automatically detecting potential issues such as tilted boxes or obstacles that could damage the gripper. If needed, the system can also measure the fill level of boxes without slowing down operations, ensuring efficient and reliable performance.

Precise image processing and flexible application possibilities

The VMT DeepScan 3D stereo sensor generates a highly detailed point cloud of the pallet and the boxes stacked on top. This raw data is analyzed using a multi-stage image processing procedure to extract all relevant information, such as the exact position and orientation of the boxes. The system first trims the point cloud to the topmost layer before selecting the next box for removal and checking for any potential obstacles. Thanks to automated fallback levels and advanced processing, high reliability is ensured. Due to its flexible design, VMT DeStack is not only limited to box depalletizing tasks but is also suitable for a wide range of other destacking applications.



Highlights

- Reliable detection and error-free destacking of various box types
- Cycle time under 10 seconds
- Accuracy of ± 1 mm
- Application-specific inspections can be integrated

Bin-Picking with VMT™ PickFinder



VMT PickFinder is a process-safe, turnkey image processing solution that recognizes objects in containers, calculates the optimal path and gripping coordinates for handling machines or robots, and ensures precise, collision-free bin-picking processes.

Intelligent algorithms for multi-point path planning calculate position- and cycle-optimized robot paths for the entry and exit of the gripping tool into the container. Secondary grip strategies prevent idle runs and downtime with individual, difficult-to-grab parts.

Simultaneous image capture during the ongoing process

The gripping process in the container begins with a 3D image capture by the sensor of VMT PickFinder. While capturing the image, the robot can simultaneously process or place a previously gripped part, ensuring maximum utilization of the robot. The captured images are provided to the software as raw data, pre-processed, filtered, and compressed. An intelligent search algorithm compares the optimized actual data of the parts with stored target data, which is learned through a setup wizard or based on CAD data. This enables reliable part detection, regardless of their position or orientation in the container.



Calculating gripping points and collision-free movements

The detected parts are evaluated based on their gripping attractiveness and ranked in descending order. The accessibility of the parts and the collision-free robot path are checked. The robot grips the part that can be removed most safely and easily. If this is problematic, the secondary grip strategy directs the robot to the next part in the ranking. VMT PickFinder also provides precise positional data of the parts and the container. With multi-point path planning, the robot is guided through the container without collisions, and the correct gripping of the part is continuously checked to optimize the process.

Highlights

- Reliable 3D part detection
- Position detection of the container
- Part definition via setup wizard or CAD
- Collision-free part removal based on grip attractiveness
- Secondary grip strategies for optimal availability

Press Part Handling with VMT™ FrameSense



VMT FrameSense is a static and reliable 3D measurement system that enables precise measurement through its high-resolution 3D sensors.

VMT FrameSense has been designed for the type, shape, and position inspection of containers, as well as the automated stacking of finished parts using robots and the automatic stacking of finished parts by using robots, thereby meeting all process and operational requirements in press shops.

Precise measurement with high-resolution 3D sensors

VMT FrameSense ensures highly accurate position detection and reliable monitoring of locks by generating a precise 3D point cloud of containers, preventing collisions with disruptive edges and contours. This measurement data is crucial for safe and efficient process control. The robot can recognize and handle various container types and sizes with millimeter precision. Additionally, the 3D data provides valuable insights for quality and geometry control, as well as the lifecycle management of containers.



Easy handling and flexible system architecture

VMT FrameSense stands out for its easy setup, operation, and maintenance. With no moving components, the system offers maximum robustness and accuracy, making it highly dependable. To distinguish containers and measure their position and geometry, VMT FrameSense uses a shape-based probing method that captures the complete outer contour of the part in precise detail. Depending on the application and the containers in use, the number and arrangement of sensors can be flexibly adapted for optimal results. Continuous expansion of the VMT software platform with new algorithms, evaluation methods, and applications ensures the system remains highly flexible and adaptable to a wide variety of industrial uses.

Highlights

- Position determination: High-precision positioning of relevant subareas
- Collision prevention: Prevents entry into closed brackets or occupied containers
- Lifecycle Management: Monitors condition, quality, and geometry
- Flexibility of system design

VMT solutions for logistics

VMT DeStack

Automatic depalletizing

VMT PickFinder

Robust Bin-Picking system

VMT FrameSense

Container inspection system

Subject to modifications
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Printed in Germany • 10/2024

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