Precise Docking and Reliable Identification of AGVs

Rugged Reading Head Code Tape System for Reliable Applications up to SIL 3/PL e

At a Glance

- Reliable identification of automated guided vehicles (AGVs) up to SIL 3/PL e

- Highly precise positioning of the AGV at the transfer station

- Rugged system consisting of compact optical read head and metal Data Matrix code bars

- Safe position monitoring makes it possible to customize other navigation functions, such as a LiDAR scanning field, depending on the situation

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The Application

Automated guided vehicles (AGVs) are increasingly taking over the transport of goods in warehouse and production logistics. They automatically detect the activated transfer stations and move to the position, enabling a smooth transfer of the goods carrier. Precise positioning is a prerequisite for subsequent steps such as activating a gate controller, establishing reliable communication, and triggering the transfer process.

The Goal

The AGV needs to automatically find its exact position at the right transfer station. The following steps are often relevant to safety, so positioning must meet the requirements of functional safety. Identifying the AGV safely—the right vehicle in the right place—is absolutely essential. In addition, reliable communication between the AGV and system components, such as an automatic gate controller or an emergency stop circuit, is required. Clear and safe identification is required to initialize this communication between the vehicle and the controller.

The Solution

The safe Position Guided Vision (safePGV) positioning system creates the basis for safe and accurate positioning of the AGV. The sensor mounted on the vehicle reads the Data Matrix codes applied to the ground at the docking position of the transfer point. The position information enables the exact positioning of the AGV with an accuracy down to 0.2 mm. This allows logical docking of the AGV as a basis for a smooth transfer of the goods carriers.

The safe signal of the read head is transmitted to the higher-level controller with the vehicle identification. Each individual Data Matrix code in a system is unique. The position of the Data Matrix codes in the system enables the AGV to be uniquely and safely identified in the respective plant section. The safe position information of the read head can serve as a basis for further functions relevant to human safety.

The Benefits

The system is as compact as it is rugged. The sensor can also be used on small AGVs, and the metal code tape is extremely stable and durable. Identification is noncontact. The large reading window captures a larger section of tape with several codes at any time. This ensures reliable detection of even damaged or dirty track tapes. Quick and easy commissioning follows the plug-and-play principle. By transmitting the Y position and the angle, track deviations can be continuously corrected. The output of the X position is highly precise with an accuracy of 0.2 mm. The system, consisting of read head and Data Matrix code, is certified to SIL 3 and PL e.

Technical Features

- Safety integrity level SIL 3

- Performance level PL e

- Non-safe x and y accuracy 0.2 mm

- Non-safe angular resolution 0.5°

- Large reading range (120 × 80 mm)

For more information, visit: **pepperl-fuchs.com/px-safePGV**