Safe Docking of AGVs at the Transfer Station

DAD15 Optical Data Coupler for a Rugged and Simple Solution Compliant With PL d

At a Glance

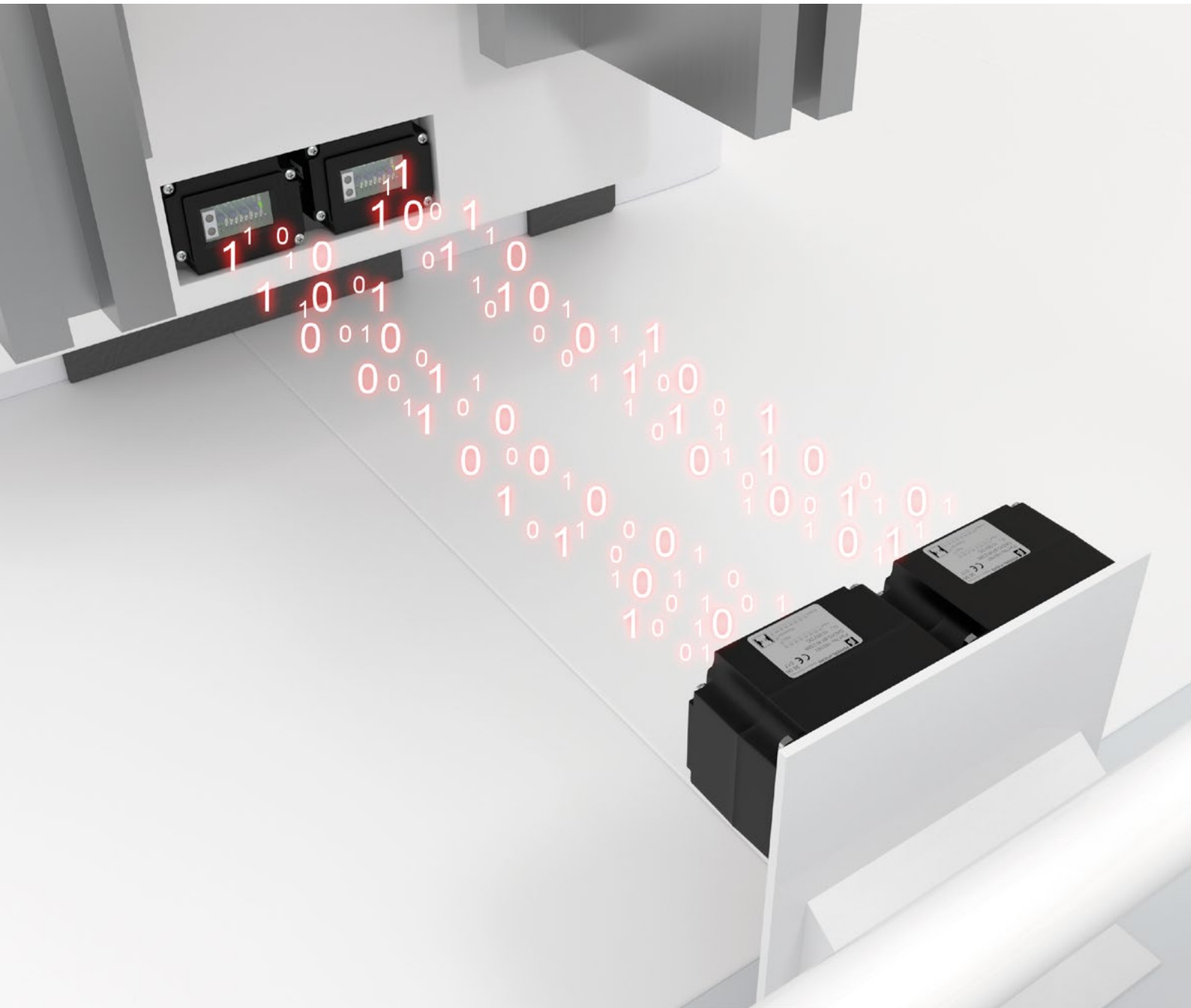
- Reliable verification of the correct position
- Bidirectional communication for reliable identification of the vehicle and station
- Safety-related positioning and identification with little effort and low costs
- Rugged alternative to radio-based transmission methods without transmission overhead

The Application

In production and warehouse logistics, the transport of goods and parts is increasingly carried out by automated guided vehicles (AGV) and autonomous mobile robots (AMR). They are automatically loaded and unloaded at transfer stations where the vehicle must be docked beforehand. The only way to ensure a smooth and safe handover of the goods carrier is a proper docking process. Before transferring the load, the vehicle and the loading station exchange their identifiers using reliable signal transmission.

The Goal

When the load is being transferred, the loading mechanism can cause dangerous movement. Functional safety guidelines require verification that the vehicle is in the correct position at the docking station. To ensure the safety of the operating personnel and maximum uninterrupted availability of the plant, a hardware-category-3 safety concept with a 2-channel structure is required. In addition, the individual vehicles and docking stations need to be reliably identified and the system must meet performance level d.



The Solution

Two DAD15 optical data couplers each are mounted on both the vehicle and the station, and connected to a safe controller. They establish a bidirectional communication path between the components, provide the identification data, and—once completed—confirm that the docking process has been executed correctly. Modulated light pulses allow for noncontact data transfer. The required diagnostic coverage is achieved by monitoring the sensor data on both sides in a safe controller for plausibility or cross-comparison, and cycle time.

The Benefits

The DAD15 has a large opening angle and a simple data interface that allows for safety-related verification with little effort. This solution provides an easy and cost-effective way of positioning and identifying the vehicles at the docking station. The DAD15 is also characterized by a short cycle time, meaning the safety function can be checked very quickly. The optical data coupler is a rugged alternative to radio-based transmission methods. The implementation is simple and there is no transmission overhead.

Technical Features

- Thru-beam sensor with infrared LED
- Interface: 8 bit parallel, bidirectional
- Operating voltage: 10 V DC ... 60 V DC
- Compact housing (76 × 53 mm)
- Degree of protection: IP67
- Very large opening angle
- Cascadeable
- Temperature range: –20 °C ... 60 °C

For more information, visit: **pepperl-fuchs.com/px-DAD15**