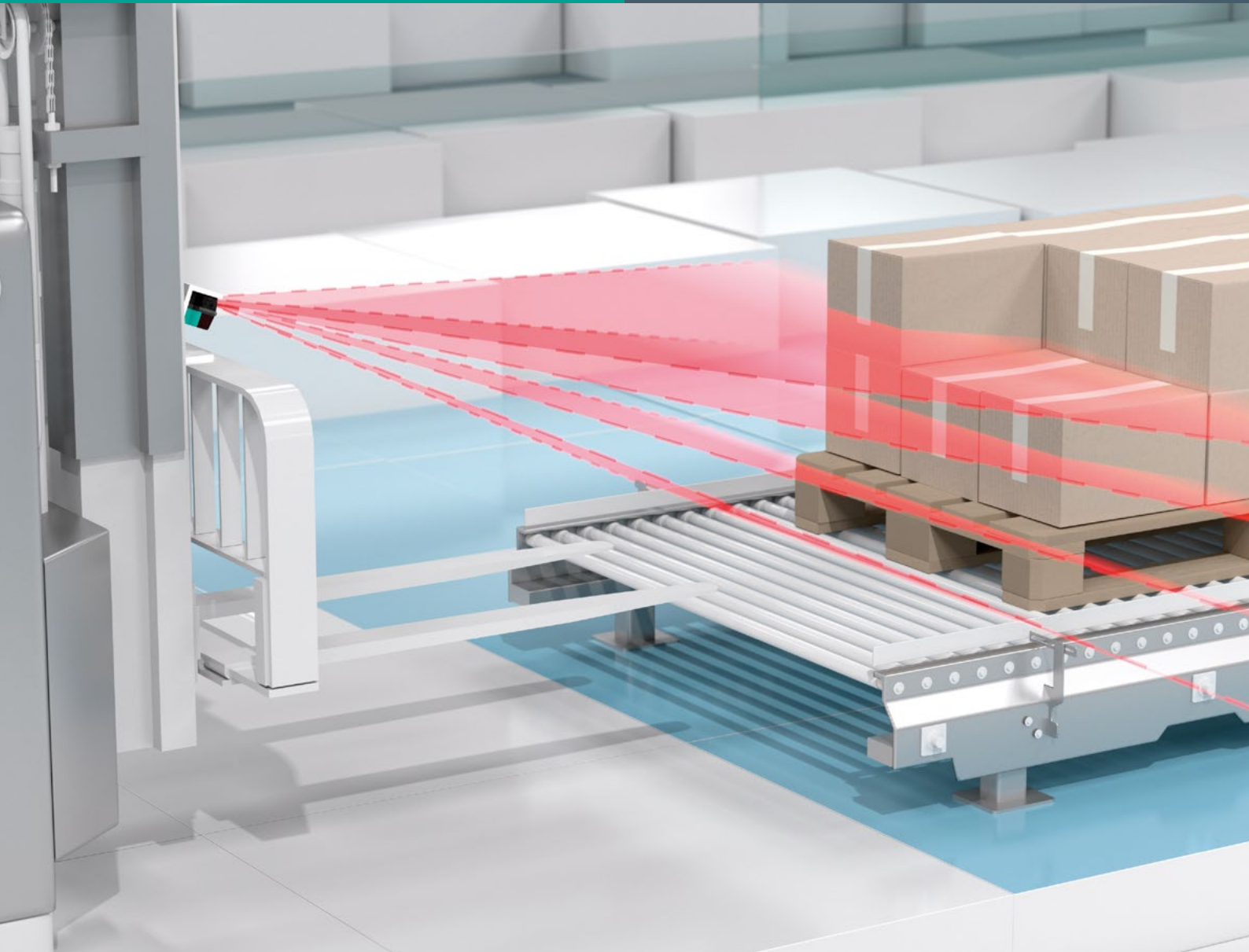


Reliable Load Detection during Transfer

LiDAR Sensor with Four Scanning Layers Provides Accurate 3-D Data for Automated Guided Vehicles

At a Glance

- Precise detection of load contours and distance from the vehicle
- Four scanning layers create a 3-D point cloud with detailed mapping of even the smallest structures
- Compact design enables flexible integration
- Resource-saving processing of the measurement data
- Simple orientation and commissioning



The Application

Automated guided vehicles (AGVs, AMRs) are increasingly taking on transport tasks in production and warehouse logistics. In addition to navigation while driving, loading and unloading at transfer stations must be handled automatically. The position of the load is precisely recorded to ensure the correct transfer to free spaces on the ground.

The Goal

The vehicle or the appliance for carrying the load (e. g., the fork arms of a forklift) must be positioned correctly before lifting the load. During the loading process, it must be ensured that the load does not move out of place. For example, when transporting pallets, the exact position of the pallet pockets relative to the vehicle must be determined. It must be ensured that the fork arms move into the pallet pockets and do not mistakenly move the pallet away from its standing position.

The Solution

An R2300 series 3-D LiDAR sensor is attached to the vehicle's mast so that its sensing range is aligned with the load. When the AGV approaches the load and once the load is on board, the sensor provides measurement data to the vehicle controller as a 3-D point cloud. It shows the contours of the load and its distance from the vehicle with the accuracy required. The four scanning layers of the sensor ensure a reliable three-dimensional detection result. The small light spot of the sensor

and its very high angular resolution of 0.1° enable precise detection of even the smallest structures. Using the time-of-flight method (Pulse Ranging Technology, PRT), the R2300 provides reliable measurement data that is largely independent of ambient and object conditions.

The Benefits

Recording with R2300 provides a simple and cost-effective solution for the task. The compact sensor allows flexible integration and resource-saving measurement data processing thanks to optimal 3-D representation. When activated, the pilot laser allows the device to be aligned very easily and commissioned without additional tools. Without moving parts in the electronics, the sensor is especially resistant and its function is not affected by harsh ambient conditions such as vibrations and shocks. It can replace multiple devices with only one scanning layer. This significantly reduces the cost of acquisition, wiring, and integration.

Technical Features

- Measuring range up to 10 m
- Scanning angle up to 100°
- Repeat accuracy 12 mm
- Measuring laser infrared, alignment laser red (both laser class 1)
- Angle resolution 0.1°
- Measuring rate up to 4,000 pixels per frame
- Interface: Ethernet UDP 100 Mbit/s

