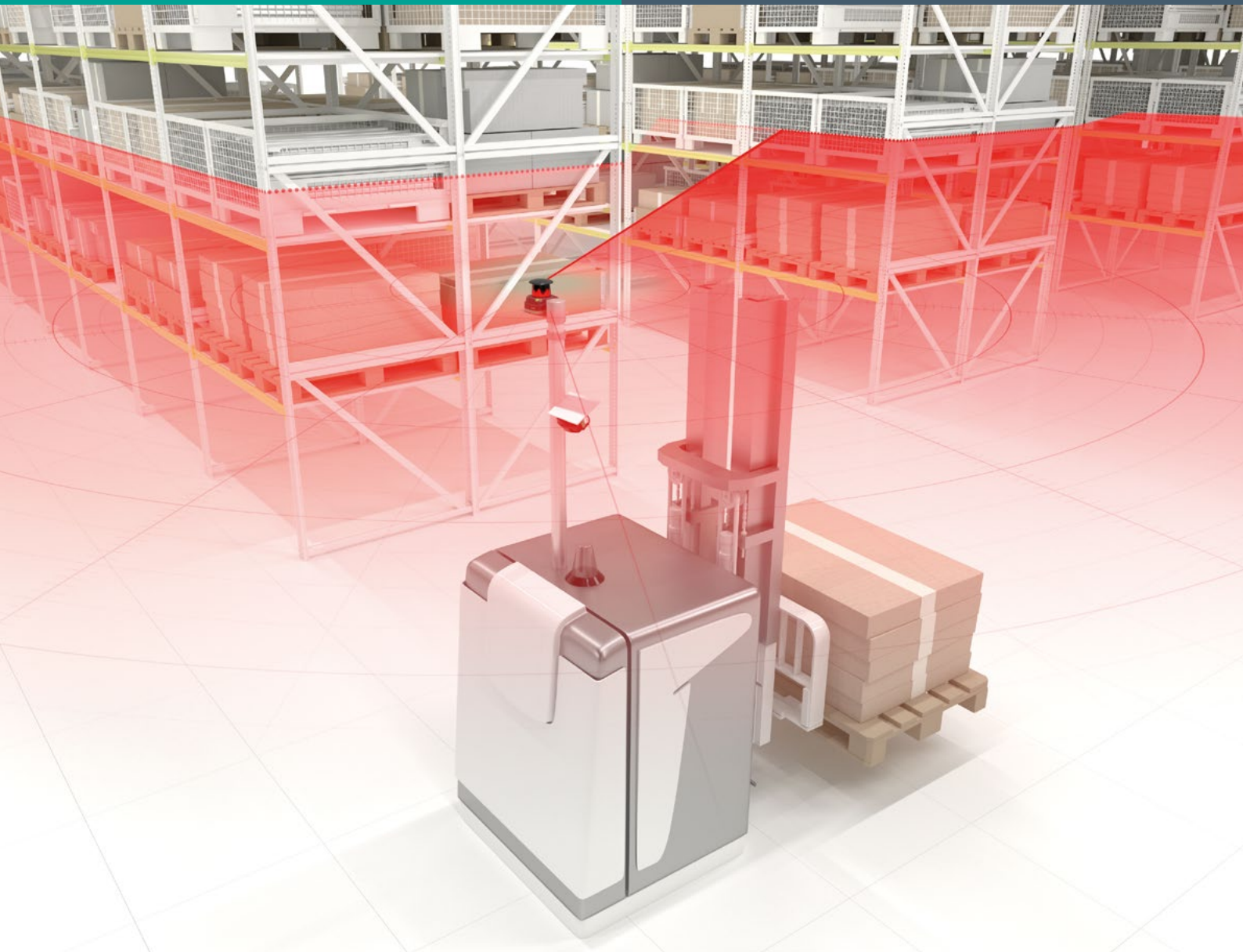


Precise Orientation for Automated Guided Vehicles

R2000 2-D Laser Scanner
With 360° Visibility
And a High Scan Rate

At a Glance

- Position data that is accurate to the millimeter enables quick and precise AGV control in dynamic applications
- An exact time stamp and measured-data filter facilitate integration into the vehicle control system
- Interactive parameterization for easy commissioning
- Compact design means the laser scanner can be installed on small vehicles and in confined spaces



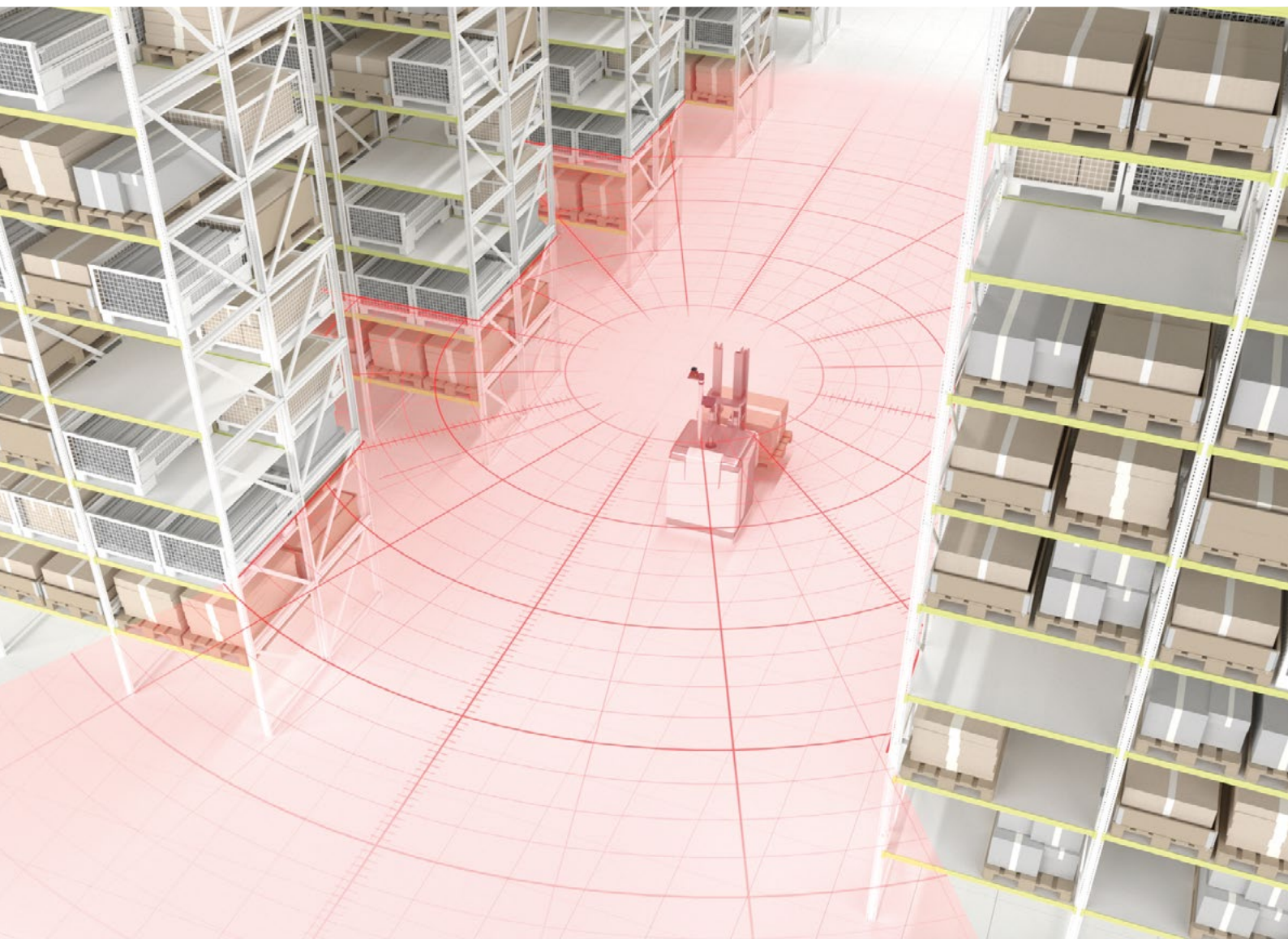
The Application

Automated guided vehicles (AGVs) are increasingly taking over the task of transporting goods in warehouse and production logistics. To achieve this, different types of vehicles can be used within the same facility. A distinction is made between automated guided vehicles (AGVs) and autonomous mobile robots (AMRs). Depending on the size and type of application, the vehicles have different sensor technology requirements for orientation and navigation. AGVs usually travel directly on fixed routes without detouring, so they handle goods quickly. AMRs offer increased flexibility, as they travel using specifically calculated routes while avoiding any obstacles.

The Goal

AGVs should accurately navigate from point A to point B. The sensor technology used for this has to be able to immediately supply reliable orientation data to the vehicle control system while the AGV is in motion. The sensors have to map out the environment and the target destinations with the required precision and enable the control system to react dynamically and appropriately to changeable environments. For instance, objects in the travel path need to be detected in time so that they can be avoided. In addition, sensors from different vehicles must not interfere with each other.

When highly accurate navigation is required, reflectors can be used to support orientation. If reflectors are not used, the position of the AGV is determined using contour navigation.



The Solution

The R2000 series of photoelectric sensors use high-performance Pulse Ranging Technology (PRT). These 2-D laser scanners deliver clear, highly accurate measurement results at any time, determining the absolute position with comprehensive 360° visibility and millimeter precision. The series includes device versions that align measurements with reflectors and versions that detect contours. There is also another version that combines both options. The detection range can be adapted to the requirements of the respective vehicle class.

The Benefits

An exact time stamp in the measurement data and a measured-data filter enable the device to be adapted to the vehicle control system. Interactive setup functions make commissioning simple. The very high angular resolution and the exceptionally small light spot of the 2-D LiDAR sensor ensure a highly accurate position value. The compact design allows the sensor to be easily integrated, even in small vehicles. The high energy density of the laser pulses and intelligent filter mechanisms prevent the measurement being distorted by ambient light and minimize the possibility of cross-talk if there are multiple AGVs active in the same area.

Technical Features

- Comprehensive 360° visibility
- Angular resolution up to 0.014°
- Detection range for natural surfaces up to 60 m, for reflectors up to 200 m
- Time stamp on the measurement data to facilitate synchronization
- High scan rate of 50 Hz for high-speed applications

