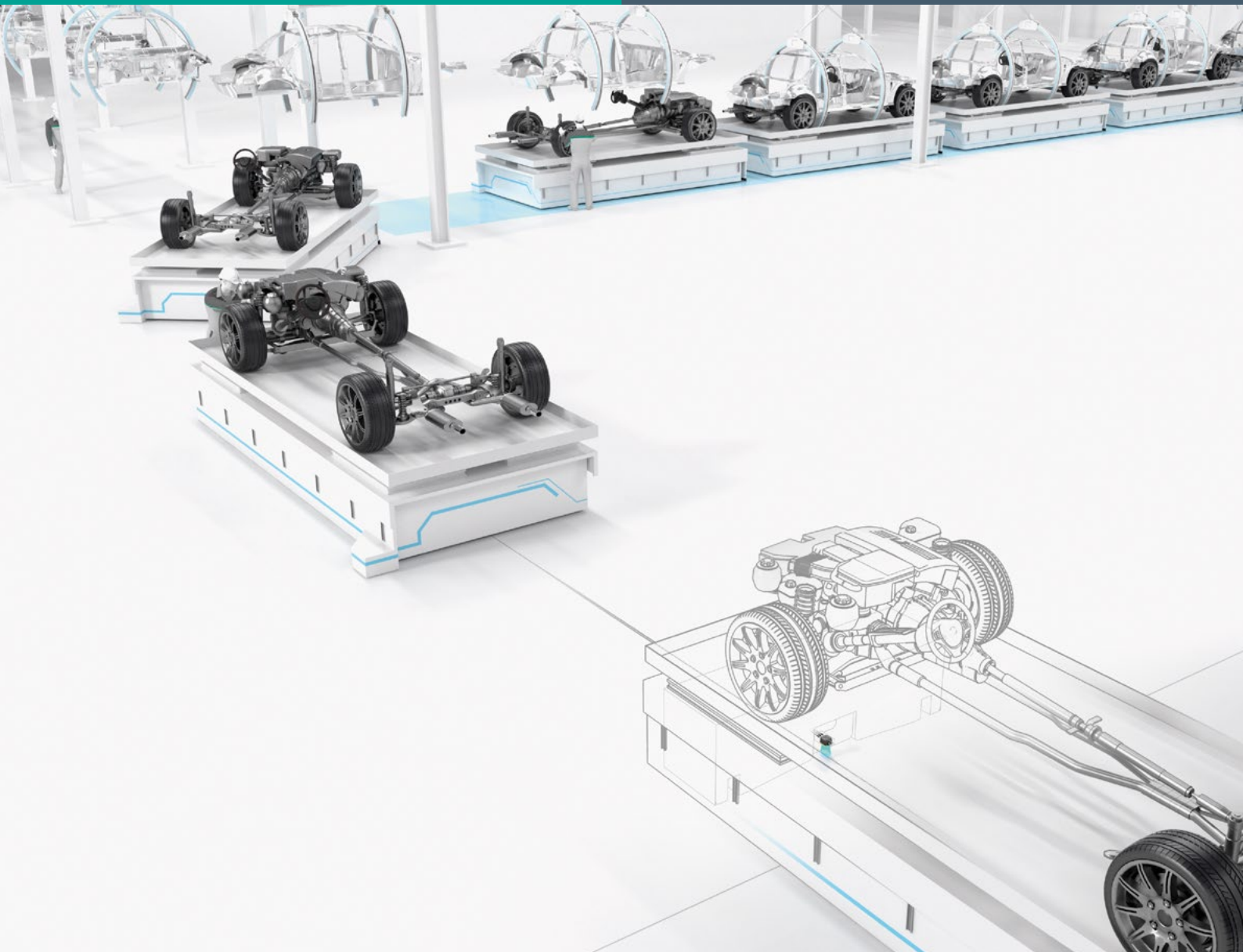


Reliable Position Determination for Automated Guided Vehicles

SIL 3/PL e with Just One Sensor and Rugged Data Matrix Codes

At a Glance

- Safe SIL 3/PL e-compliant absolute positioning with a single sensor
- Large color codes provide reliable information for high-precision positioning
- Reliable positioning even with dirty or damaged codes
- Metal code bars for mechanically stressed sections of the line
- Compact device suitable for confined spaces
- Plug-and-play commissioning

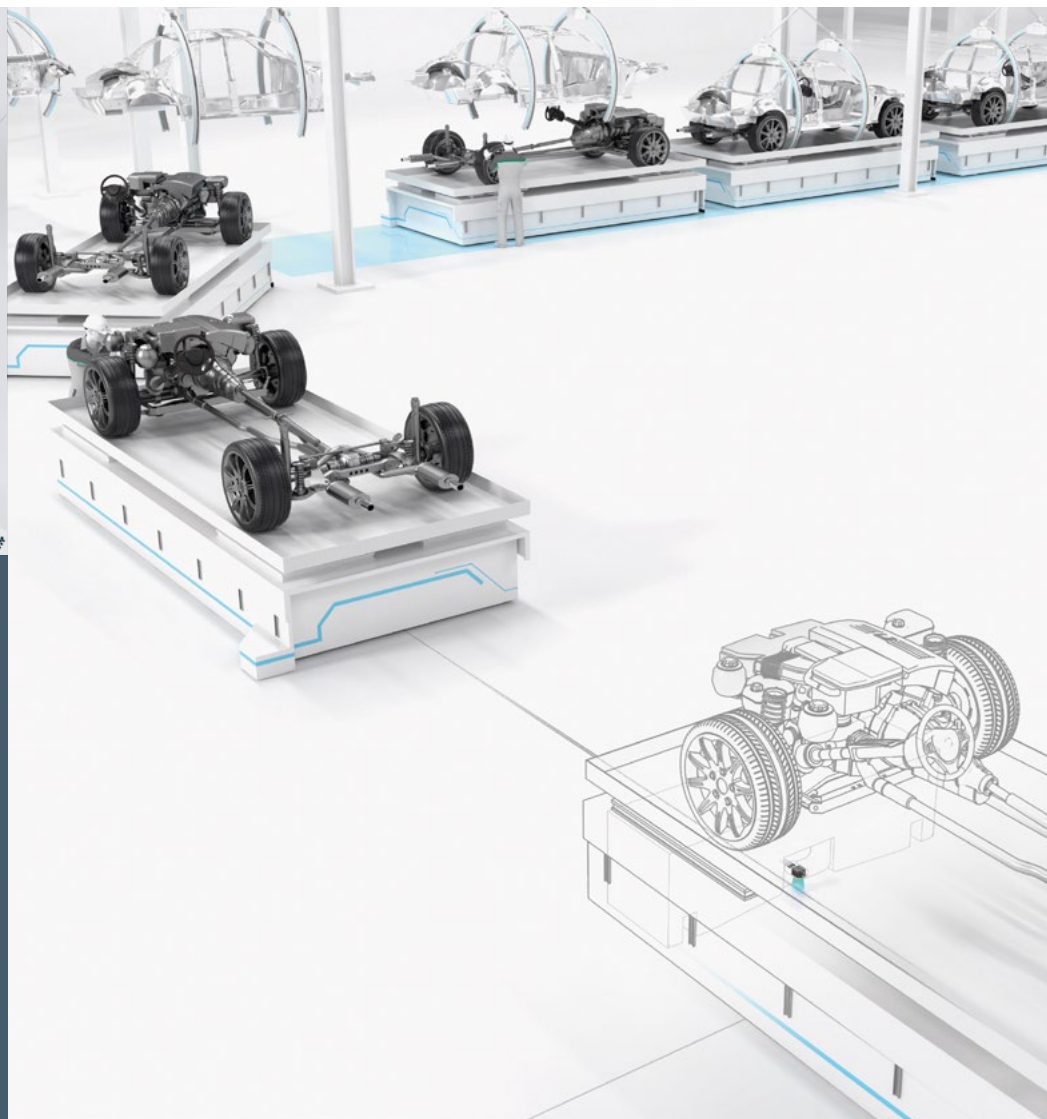
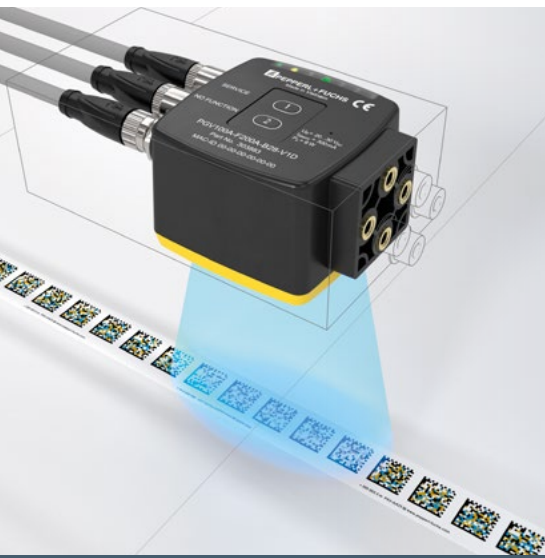


The Application

In industries such as automotive and mechanical engineering, automated guided vehicles (AGVs) are often integrated into automated production lines. For example, they transport chassis along a predetermined route to the various assembly stations. At such stations and transfer points, especially when using robots, the AGVs are precisely aligned to enable smooth interaction. People work and move along the production lines; there can be a lot of vehicle traffic in the immediate vicinity.

The Goal

The accurate guidance and positioning of AGVs is a basic requirement for smooth running throughout the production line. To reliably protect people and material from unwanted encounters, the positioning of AGVs must be functionally safe at all times. The correct distance between the individual vehicles must also be maintained. Safe positioning must meet the requirements of SIL 3 or PL e and be designed to be correspondingly robust.



The Solution

The safePGV positioning system allows for reliable absolute positioning in accordance with SIL 3/PL e using just one sensor. The new safety technology combines a 2-D-read device with a multicolor Data Matrix code tape. Each individual code is therefore already inherently redundant. LED rings with red and blue light enable the different colored codes to be read. The firmware's secure algorithm compares the optical signals. A safety controller performs an independent plausibility check. Only then is the data transmitted to the safe controller. In addition, the sensor's large reading window can detect five Data Matrix codes simultaneously to ensure a position determination of ± 0.2 mm even in the case of heavily contaminated or damaged codes. Rugged metal code bars are available for sections of the line that are subject to heavy mechanical stress.

The Benefits

The sensor has a wide depth of focus range and can be mounted with a distance of up to 130 mm from the Data Matrix code tape. The available code variation is sufficient for a distance of up to 100,000 m, which may also allow narrow curve radii. The code tapes can be interrupted for up to 75 mm without affecting the detection process. In addition to absolute positioning, the sensor also provides all values for reliable control. By transmitting the Y position and the angle, track deviations can be continuously corrected. The safe X position ensures the safety distance of AGVs and therefore also the protection of people between the vehicles. The compact device can also be used in small vehicles; commissioning follows the plug-and-play principle. The PROFINET PROFIsafe protocol allows integration into any safety controller.

Technical Features

- Positioning accurate to ± 0.2 mm
- Safe position according to SIL 3/PL e
- PROFIsafe interface
- High ambient light compatibility (30,000 lux)
- Traverse distance up to 100 km
- Typical field of view 120 mm \times 80 mm
- Degree of protection: IP67

