



Figure 1: Automated P250 in the automotive industry

## Task

Goods are transported automatically from sources to sinks. The AGV moves along predefined routes.

## Implementation

### Vehicle

Linde P250 BR5007 vehicles were equipped with automation technology for the transport task.

### Job creation

Job creation via a master control system has the advantage that the transport orders can be generated from the internal goods management system.

Alternatively, a local software of the vehicle can take over the control of the orders. Manual specifications are then required for order generation.

### Navigation

Transport between the pick-up and drop-off points takes place along predefined routes. Surrounding navigation is realized by a laser scanner on the AGV. Transponder markers, GPS and camera navigation can also be used.

### Speed

Technically, speeds of over 10 km/h are possible. In practice, only 5 or 6 km/h are often achieved due to weather conditions and the type of trailer (brake yes/no?). The decisive factor here is the risk and hazard analysis.

### Automatic coupling and uncoupling

The trailers to be uncoupled are positioned at the marked positions at creep speed. For precise coupling, the AGV uses the rear-facing safety scanner to "aim" at the drawbar eye



Figure 3: Automatic coupling

marked with marks. The status of the coupling pin is monitored by a roller lever switch so that a signal is sent to the vehicle when the trailer coupling is released.

### Safety

A comprehensive safety concept, derived from risk and hazard analyses, guarantees operation free of personal injury and material damage.

### Other functions and equipment

- Sensor taps for safe speed and steering angle detection
- Safety laser scanner for person detection
- Laser scanner on the roof structure for machine protection
- Four emergency stop buttons
- Signal light on the roof structure for visual and acoustic signal output
- Radio communication (e.g. WLAN, 5G) with existing conveyor technology, control station or internal goods management system
- Automated charging of the vehicle battery in a charging station
- Control display in the driver's cab
- Control panel on the outside of the AGV with illuminated buttons
- Possibility of manual operation remains (driver operation)



Figure 2: Automated P250 outdoors



Figure 4: Series automation of the previous P250 generation

