



CASE STUDY



1 | Challenge:

Enabling a completely automated operation of driverless transport systems

"For our project with six fully automated industrial trucks and a flexible, fully autonomous battery changing station, in HOPPECKE we have found our partner for intelligent battery management systems, to implement the project successfully. We would like to thank the HOPPECKE company for the good cooperation and for a smooth process".

STEFFEN BOHL

Electrical engineering development
DIMOS Maschinenbau GmbH



A completely driverless transport system (AGV) was to be created for a Chinese steel manufacturer. In order to meet the customer requirements, HOPPECKE, together with its long-standing customer DIMOS Maschinenbau GmbH, provided a custom-fit solution.

Many businesses are increasingly faced with the challenge of finding an internal transport solution that is both flexible and fully automated. This is also the case with DIMOS Maschinenbau GmbH, a long-standing customer of HOPPECKE.

Controlled by networked systems, driverless transport systems are at the heart of every state-of-the-art warehouse. They not only facilitate work in intralogistics, but also they ensure that the required goods are

transported autonomously to the right place at the right time, giving greater efficiency and cost savings to the customers operation.

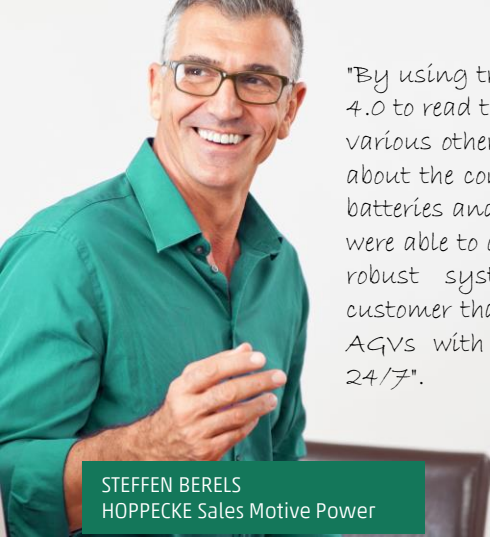
However, although the AGVs perform their work autonomously, without ground contacts for automatic inductive charging, they require human intervention to change and recharge their batteries. This human intervention can slow down the operation and reduce the efficiency of the intralogistics process.

Fluctuating fleet utilization due to lack of available charged batteries

Delayed logistics processes due to vehicle downtime

Susceptibility to errors during battery changing through incorrect battery withdrawals

Damage to battery trays during the battery changing process



"By using trak | monitor 4.0 to read the status and various other information about the condition of the batteries and chargers, we were able to develop a very robust system for the customer that supplies its AGVs with the batteries 24/7".

STEFFEN BERELS
HOPPECKE Sales Motive Power

Extended battery lifetime through taking of optimally charged batteries

Savings in maintenance costs through reduced service calls

Increased operational safety due to automation of battery changing

Concentration on the core business through fully automated processes

2 | Solution: Flexible and fully automated battery changing station

In this application, a driverless transport system drives autonomously into the changing station when its battery is empty. An automated swap car pulls the empty battery out of the AGV and drives it to a free charging station. The battery is then automatically connected, charged and monitored.

With a total of 18 batteries and 13 chargers, a flexible and fully automated battery changing station for AGVs was put into operation for the first time in April 2020. The battery changing station uses the low-maintenance and quick-charging trak | uplift batteries in combination with the matching trak | charger HF premium with intelligent power module management.

Each battery is equipped with an intelligent battery controller, the trak | collect. The battery controller reads relevant data such as the charging status and operational readiness

of the battery, and then communicates this with the chargers and the new HOPPECKE trak | monitor 4.0, a cloud-enabled system for battery, charging station and data management.

The trak | monitor 4.0 processes the data from the chargers and the battery controller. Via a standardized communication interface, it makes this data available for the controlling of the system, in this fully autonomous application. In order to insert a charged battery into a driverless transport system, the trak | monitor 4.0 informs the plant control system of the position of the battery proposed for replacement. The battery is autonomously removed from the charging station by the battery changing car, driven to the AGV and inserted into it. After the successful exchange, the AGV can continue its job with a fully charged battery. Therefore no human assistance is required for the entire process.

If the HOPPECKE battery controller trak | collect detects a need for maintenance on a battery, the trak | monitor 4.0 will transmit the corresponding message to the central management system. The battery is then automatically moved to a separate service station where the necessary maintenance work can be carried out, allowing for a quick reaction to any needed service or maintenance.

Key Benefits

- Protection of the investment through optimal battery operation and battery charging using HOPPECKE technology
- Extended battery life through systematic use and optimal utilization of the battery pool
- Saving resources through fully automated battery changing in the charging station
- Greater efficiency through increased transparency
- Minimization of downtime through improved planning of charging times, leads to maximum availability of the vehicle fleet
- Early detection of potential problems through detailed information about battery condition
- Reduction of maintenance costs for battery service and maintenance

3 | Products:

- ▶ **Batteries:** trak | uplift
- ▶ **Charger:** trak | charger HF premium
- ▶ **Battery controller:** trak | collect
- ▶ **Battery management system:** trak | monitor 4.0

Watch Video Now:



HOPPECKE

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