**Modern intralogistics**

**Audi relies on item's Building Kit Systems for flexible transport trolleys**

**The premium automotive manufacturer AUDI offers its customers numerous options for the individual configuration of their cars. In order to efficiently and safely organise the transport of a wide variety of components required for the production of the A8 in Neckarsulm, Germany, Audi relies on item’s state-of-the-art intralogistics.**

The growing quantity of equipment and the individual composition of each vehicle make it necessary to find new solutions for the efficient supply of materials, especially when it comes to a top model like the Audi A8. This is particularly important for the interior fittings of the vehicles. Here, not only the wide range of differently sized components is a challenge, but also the fact that the parts have to arrive at the production line in an exact sequence. Confronted with these tough requirements, proven transport systems such as the manual tugger train meet their limits.

When optimising material transport at the Audi site in Neckarsulm, another factor came into play: the warehouse and the production line are relatively far apart from each other; they are even on different levels. They are bridged by lifts. Thus, what was needed was a flexible and at the same time compact transport system that would make optimum use of the floor space in the lifts.

**Automated guided vehicle (AGV)**

To complement the rather static tugger trains, the operative assembly decided to launch a highly flexible material supply system for the production line with individual staging trolleys. In the following of the picking process, these trolleys are automatically collected from the logistics supermarket by an innovative automated guided vehicle (AGV). Delivery to the production line is also optimally synchronised with production planning. After all parts have been removed, the staging trolleys are picked up by the AGV and returned to the supermarket. The individual transport trolleys are also in constant contact with each other: transports that are necessary at short notice are automatically given priority. In the event of unexpected problems or defects, the current order is handed over to another transporter.

In order to make full use of these basic efficiency advantages of a automated guided vehicle, Audi had to overcome two hurdles: first, the technical realisation of the AGV, and second, the complex route guidance and planning. At any given time, numerous individual transporters are on the road simultaneously. Each transporter has a precise hall plan stored in its memory and also navigates according to route markings positioned in the hall. At the same time, the switch to flexible individual transports also increases the complexity of configuring the staging trolleys used. Ultimately, an individual transport solution must be found for each component and modularly adapted to the existing basic structure of the staging trolley.

**The optimal staging trolley for an AGV**

A solution was sought on which up to 24 components can be flexibly transported at the same time on a base area of 120 cm x 120 cm. The dimensions of the staging trolleys become very relevant in that they determine during operation how large the additional protective zone around the driverless transport vehicle must be set for employee and process safety. As soon as an obstacle is detected within the protective zone, the driverless transport system stops for a few seconds. If the blockage, such as an employee standing in the lane, cannot be cleared within this period despite the warning signal, the AGV interrupts the transport until it is released again by the control centre.

Keeping the weight of the staging trolleys as low as possible reduces energy consumption on the long routes within the hall in Neckarsulm. These routes sometimes lead over uneven ground, for example over the thresholds into the lift. It was therefore necessary to find a connection technology that would remain permanently stable under these conditions without having to rely on welded joints. Finally, in case of model changes, the staging trolleys should be easily adaptable to the new specifications. Due to the many electronic components for the interior of the Audi A8, including numerous safety-critical components such as airbags, the staging trolleys must also be dissipative as part of the ESD protection within the EPA.

**item in the automotive industry**

item profile technology has already proved its worth in many situations at Audi in Neckarsulm: For example, even before the current intralogistics project, installation columns, [Karakuri/LCA solutions](https://karakuri.item24.de/en/) and [machine enclosures](https://www.item24.de/en/productworld/machine-enclosure-system-xms.html) from item were part of the general picture in the hall. Together, they went about planning 200 staging trolleys, which were then to be delivered assembled and ready for use by item. The enormous range of components available in the item [Building Kit Systems](https://www.item24.de/en/productworld.html) proved to be a great advantage, enabling individual solutions to be found quickly for the efficient transport of the individual components. It is also important that the item staging trolleys can be easily adapted in the CIP and in the event of general changes in the production and transport process.

A parallel project in the hall is the conversion to paperless loading lists. In future, the workers will receive their orders digitally via a tablet. A corresponding holder for the tablet could be retrofitted without any problems. The modular construction system also made it possible to add additional transport safety devices without having to make major changes to the existing construction. For Audi, it was extremely important that the employees in material staging could continue to work in an ergonomically optimal way despite the changeover to a compact and efficient AGV. For this reason, numerous staging trolleys have integrated turntables and drawer systems. Both solutions support the ergonomic picking and unloading of materials, especially with staging trolleys that can be loaded from both sides.

**Conclusion**

When it comes to the flexible and modular design of staging trolleys in combination with an automated guided vehicle system, the advantages of item's Building Kit Systems come into their own when used in the automotive industry. The use of bolted connections makes conversion and expansion quick and easy. At the same time, the durable connection technology from item ensures a high level of reliability and low maintenance requirements.

Another advantage is that in item, Audi has a project partner who knows exactly what the task is and what the conditions are on site, and who works out the best possible solution for the specific application in close personal consultation. As Audi's managers are able to draw on item's extensive experience in the design and assembly of high-quality customer solutions, they can concentrate fully on the ongoing optimisation of the driverless transport system. To this end, Audi's Neckarsulm site will continue to work closely with item's service team.

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**Photos: 3**

**Caption:** The item staging trolleys, which are made from components of the item Building Kit Systems, can be combined with driverless transport vehicles from AUDI AG and are flexibly configurable.

**About item**

item Industrietechnik GmbH is the pioneer in modular systems for industrial applications and a partner to the manufacturing industry around the world. The product portfolio includes more than 4,000 high-quality components for the design of machine frames, workstations, automation solutions and lean production applications. item has received numerous awards for products with trend-setting industrial design and consistent ergonomics.

As a pioneer in digital engineering, item is driving the digitalization of design processes with software tools developed in-house. The item Academy offers education and training through multilingual online courses and training-on-demand.

item is headquartered in Solingen and is represented internationally by subsidiaries. With know-how and passion, around 900 employees worldwide develop innovative solutions and services. Customer proximity in Germany is ensured by eleven locations. A global logistics chain ensures that all components are delivered at short notice.

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