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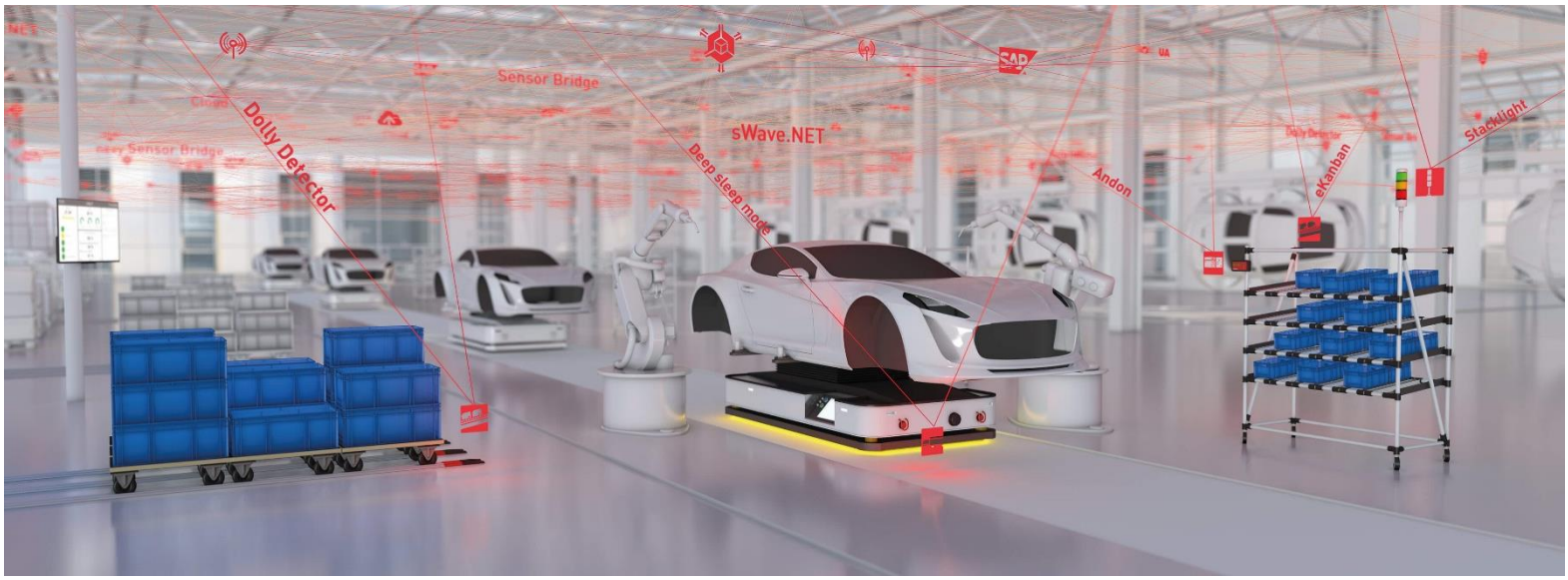
>> **Special LogiMAT 2023**

Transparency down to the last metre



MATERIAL FLOW – At Volkswagen in Dresden, "transparent manufacturing" is completely real, as more and more production companies now realise the principle of complete transparency, at least at the level of material flow. A wireless automated material requisition system closes the (information) gap down to the last metre.

All materials perfectly captured? In completely digitalised production companies, for example in the automotive industry, this is really a matter of course. Core components, such as bumpers or seats, are tracked individually and without interruption.

But in assembly areas not only large articles like these are moving around, but also numerous boxes containing small parts such as fastenings and assembly aids. The ERP system monitors boxes as they leave and arrive, requesting replenishment as necessary, but over time the stock of materials actually available increasingly deviates from the values in the IT system. This can be, for example, because several hours have elapsed between replenishment requests, resulting in a high positive stock balance difference. In addition, only the requirement at the assembly point itself is recorded. The ERP system does not capture any containers moving to and fro.

This imprecision in stock control despite digitalisation has caused some companies to take a step backwards in their automation process and to use staff as line runners, recording the actual requirements and stock at assembly points. Or they work with "good old" Kanban cards. Others have set up operator terminals in the assembly allowing materials to be requested according to the "pull principle".

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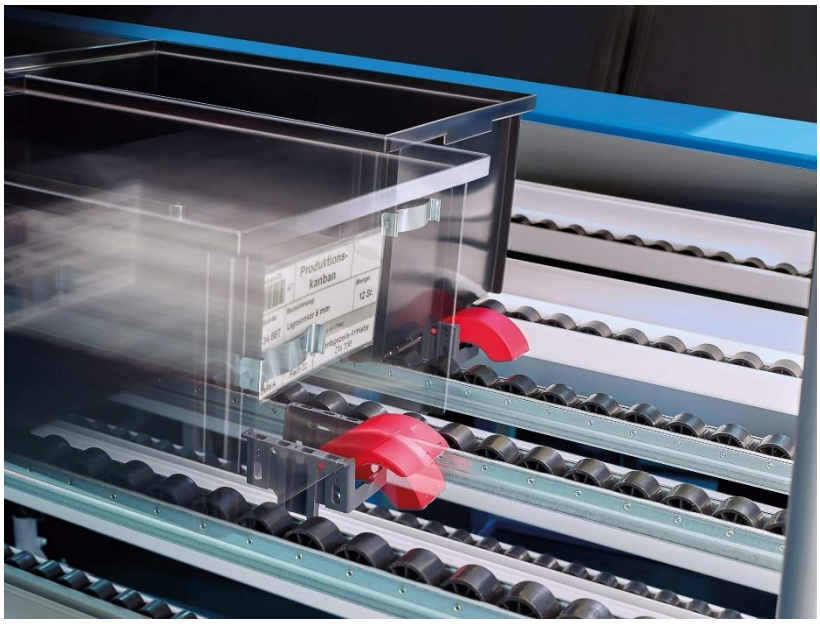
Wireless network for stock control

From an IT perspective, this really is a backwards move, and usually its function in practice is far from ideal. A permanent improvement can be brought about, however, by a wireless automated material requisition system.

With "nexy", steute has developed just such a system. Based on wireless switching devices for point-to-point connections, an industrial wireless network has been created in which wireless sensors act as terminal devices, capturing the occupancy of containers, boxes and packaging units. In order for the system to remain "lean", the containers themselves are not permanently monitored. Instead, the wireless sensors are fitted to the transport vehicles and the storage locations or channels.



Container positions inside the rack are captured by sensors, the signals sent remotely

Different wireless sensors for stock monitoring

In practice, the requisition system functions as follows: wireless laser sensors capture the stock levels of large load carriers (LLC) or small load carriers (SLC) in the assembly area or the material "supermarkets". They can also detect the filling levels inside the containers and trigger replenishments as required.

Since the sensors transmit their signals remotely, the requisition system also integrates stock currently located in mobile units, such as tugger trains or eKanban racks. Special sensor variants are available for detecting dollies on monorail tracks or boxes in Kanban racks.

Multiple sensors – one wireless network

The wireless system is adapted to the special requirements of industrial production. It even works with high transmission reliability in unfavourable ambient conditions. The data "bundled" remotely can be forwarded by the Sensor Bridge software directly to the existing back-end application for further processing.

Typical applications in industrial intralogistics are preconfigured, including eKanban and AGV systems, and different applications can be operated via a single wireless platform.

Tried and tested in practice

Such a wireless automated material provision system has been tried and tested in practice, as shown by diverse examples – in the automotive industry, but also for example in the production of electronics components and in general mechanical engineering. In some cases, several thousand wireless sensors communi-

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cate with the Sensor Bridge via Access Points, ensuring transparency in the material flow.

Fast return on investment

A core question when evaluating such an automated requisition system is: What about its economic efficiency? That is very easy to answer. Exemplary calculations have shown an amortisaton period of just a few months – even when retrofitting existing assembly lines. One of the reasons for this short return on investment is the simple implementation of preconfigured applications, such as eKanban.

The specific benefits of a wireless-based requisition system docked onto the ERP or PPS are high levels of transparency and better controllability of material flow. The wireless sensors capture all processes, also in and on mobile units (racks, AGV…) and make it possible to react in real time. The consequences are an improved material supply in line with true requirements, and a reduction in the error rate. And: a perfect stock management system which visualises the real-life situation reduces the cost of capital without the risk of increasing bottlenecks or production downtimes. This is precisely the main advantage of Kanban systems.

The economic efficiency of such a solution can be increased further when the wireless system takes on additional tasks – which it easily can – such as the integration of Andon systems or the automated transfer of materials to AGV.

The wireless system can assume additional tasks in parallel, for example the integration of Andon systems

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