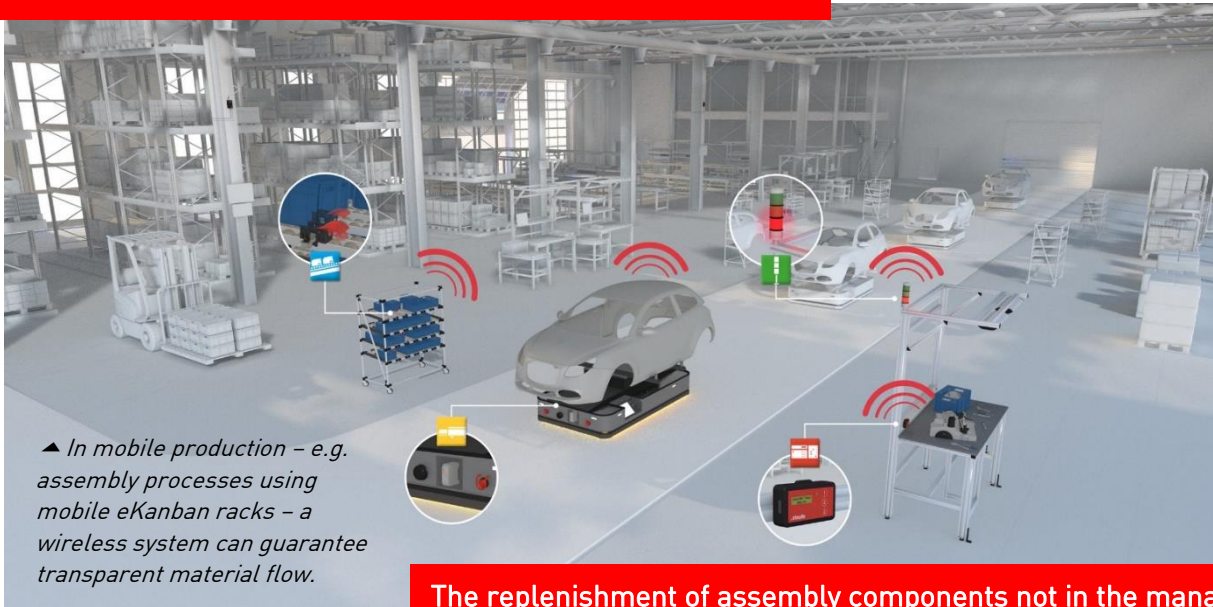


Remote material requirements planning using the pull principle



▲ In mobile production – e.g. assembly processes using mobile eKanban racks – a wireless system can guarantee transparent material flow.

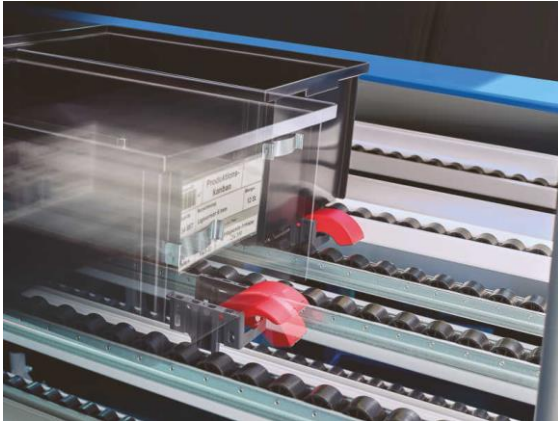
The replenishment of assembly components not in the managed inventory is a good place to start when digitalising and optimising the shop floor. For this task, a wireless-based automated materials requisition system is available to users. The cost and effort of installation and initial operation are manageable, the tools exist, and the benefits are considerable.

Many different approaches exist for the digitalisation and optimisation of assembly processes in the serial production of e.g. complex supplied parts for the automotive industry, mechanical engineering or medical equipment. From the point of view of the user, it makes sense to start where the problems occur in practice. One of these "pain points" is the replenishment of production materials not in the managed inventory. For the assembly process they are just as important as core components, and yet they are usually excluded from digitalised planning and materials provision. Instead, the solution is either Kanban cards or line runners with scanners which monitor materials stocked

at each assembly point at any one time. Some companies use terminals enabling assembly workers to request replenishments as needed.

Too imprecise: material requirements planning

In practice, users find that the quantities actually required increasingly deviate from the levels displayed in the system. One of the reasons for this is that several hours can elapse between requisitions, meaning that the actual stock balance at the assembly point can be considerably



▲ Part of the next wireless network hardware is a sensor for detecting the occupancy of shelf slots in eKanban systems.

different from that assessed. Also, there is a delay between the replenishment request and the replenishment, plus peaks in demand can occur due to orders being placed at the beginning of shifts.

In many companies, these shortcomings are becoming more noticeable as the components to be assembled become increasingly complex, i.e. entail more individual parts. At the same time, the number of variants is growing, while available space in assembly halls is shrinking.

Good reasons for digitalisation

For all these reasons, it really makes sense to take a close look at material requirements planning (MRP) in assembly halls as a "use case" in conjunction with optimising intralogistics using digitalisation – or when the conventional MRP has been identified as a factor inhibiting productivity for parts not managed in the inventory.

There is even more reason to focus on precisely this process for improvement because the latest technology means that a suitable "tool" is already available: an automated materials requisition system for

small load carriers and other containers found on the shop floor.

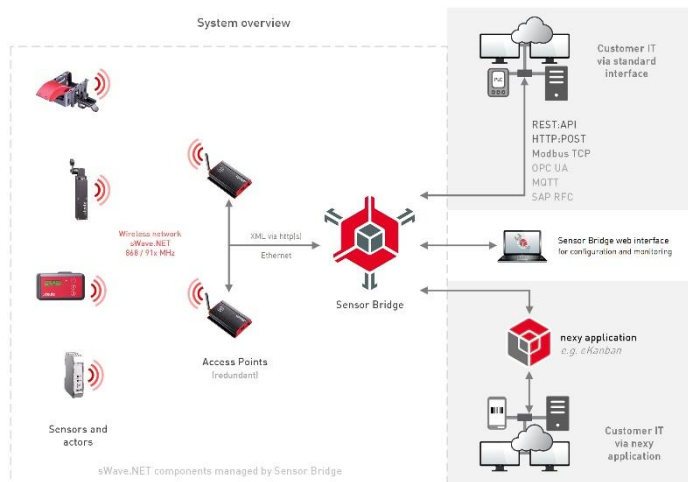
Automated remote requisition of materials

The system functions as follows: a wireless network is installed in the factory. Access Points receive data from wireless sensors in the field and pass them on per Ethernet to a Gateway. The wireless sensors are available in different versions, whereby a tilting sensor developed specifically for this use is the preferable choice for the MRP application case addressed here. The sensors can be mounted easily in assembly racks (flow or otherwise) – without the need for an external energy supply. Power is provided by a battery, making this principle also realisable with mobile eKanban racks.

Stock levels continuously monitored at each assembly point

When a worker removes a container or box from the shelf, the rocker of the (sensor-prompted) tilting sensor is automatically actuated, and the sensor transmits a wireless signal to the Gateway of the wireless system via the Access Point. The wireless system works on the globally available SDR band and provides reliable signal transmission even in the unfavourable ambient conditions of industrial production halls.

The Gateway, which has the hardware design of an industrial PC, can be connected via a Sensor Bridge to superordinate IT systems, e.g. to the customer's ERP or warehouse management system. Interfaces such as http notification, REST API and Modbus TCP are available. Moreover, shelf occupancy (or other type of level indication) can be visualised on all web-based terminal devices.



▲ An example of a nexy wireless network system

Pull not push: parts requisition using eKanban

The wireless-based nexy eKanban system thus facilitates full and current transparency for stock levels at all times. And, even more importantly, it can trigger replenishments automatically. Both the sensor hardware and the nexy software can be adapted to suit individual requirements. The user can, for example, configure whether one sensor should be installed per shelf slot or whether a multi-stage Kanban system is preferable. Adaptations can be made using the automatic materials requisition system pre-configured application.

Taking eKanban to the next level

The nexy system thus digitalises, integrates, automates and "mobilises" the Kanban process. This eKanban solution not

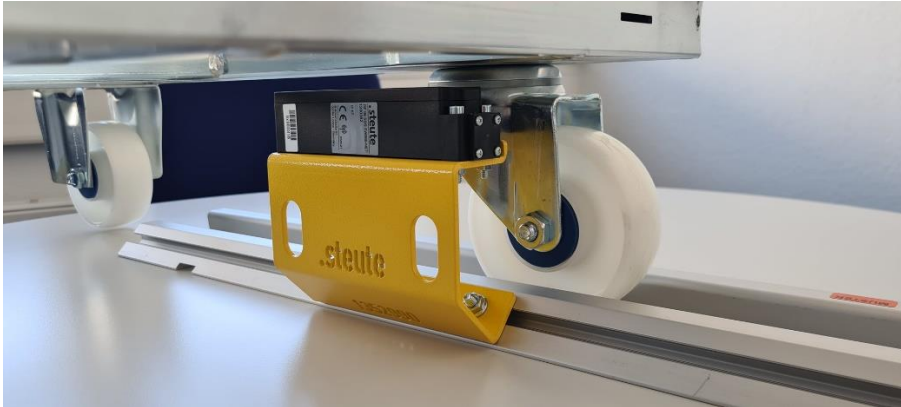
only generates and passes on information about shelf occupancy, but also encompasses the entire material flow of parts not in the managed inventory, which is hugely beneficial. One example: a new member of the sensor range with sWave.NET connection is a special sensor which fully automatically detects the removal of trolleys, trailers, carts and dollies from a monorail track. This means that e.g. tigger trains can be integrated in the Kanban process.

For the monitoring of containers and pallets in the warehouse stock, there are also some new solutions available: wireless laser sensors monitor the fill levels of SLC, monitor LLC in the warehouse, and even monitor bulk goods. The various laser sensors detect minimum levels completely automatically. Replenishments are then ordered via the nexy infrastructure.

„The wireless-based automatic materials requisition system using the pull principle has been tried and tested multiple times in practice. Examples include the manufacture of drive controls.“

Tried and tested

The wireless-based automatic materials requisition system using the pull principle has been tried and tested multiple times in practice. Examples include the manufacture of drive controls, the manufacture of automotive supplied parts and



▲ A special wireless sensor enables trolley trains to be integrated in the cable-free Kanban process.

the manufacture of devices for medical equipment. In all applications, the advantages of nexy are obvious: the current stock level at the assembly point is transparent at all times, the availability of materials is always guaranteed. Production standstills

are avoided, and all that with "lean" stocking on site. This saves costs, ties up less capital and guarantees the reliable replenishment of all assembly points with the necessary materials.

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