



01 The wireless-based automated material requisition system (AMS) sWave.NET® controls the replenishment of non-inventory-managed materials or components.

Information flow on the shop floor: closing the gap with wireless technology

Material flow made transparent – also for non-inventory-managed items. A wireless-based automated material requisition system (AMS) provides the solution and can also be used for other intralogistics tasks.

Even in very well organised production companies – for example in the automotive industry – IT-based production planning and optimisation often involves a small, yet noticeable deficit. The path of every inventory-managed component is

predefined and monitored. Non-inventory-managed parts such as connecting elements, however, are replenished according to the "good estimate" principle. This gap in the organisation in time leads to overstocking, or to potentially severe

understocking, in material supermarkets and/or individual assembly points (Fig. 1).

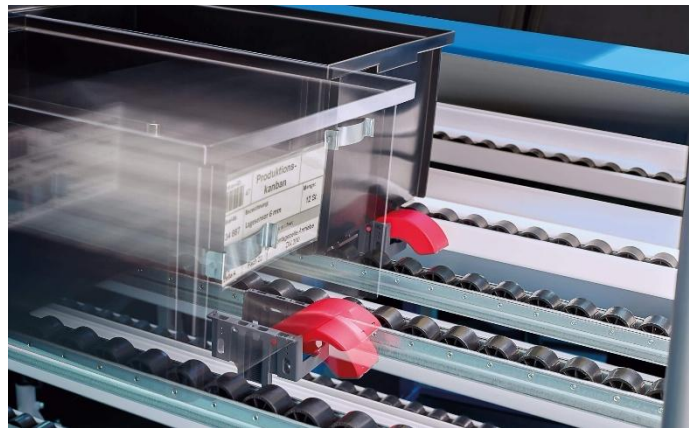
Wireless replenishment

This gap can be closed with the help of an automated material requisition system, or AMS for short. It docks onto the company ERP system and guarantees needs-based replenishments of C parts to the point of assembly. There wireless sensors are installed which detect e.g. the presence of boxes in mobile Kanban racks (Fig. 2) or, by means of laser, the fill levels of small parts in large containers. Parking areas for pallets can also be monitored in this way, as well as the stacking heights of cardboard boxes or palletized goods (Figs. 3 and 4).

The sensors monitor the stock levels. Once a predefined minimum or maximum level is reached, they transmit this information remotely via an integrated or external wireless interface, first to an Access Point and then to a Sensor Bridge interface which communicates with the superordinate IT infrastructure. This can be an ERP system, but also a WMS or AGV fleet manager, for example from Agilox, Idealworks, M. Hartwall, MHP or Synaos. This system then triggers the supply of replenishments.

Lean, flexible and expandable

Continuous monitoring of material quantities and replenishments can thus be realised down to the very last metre. The data are transmitted remotely, meaning that AGV, AMR



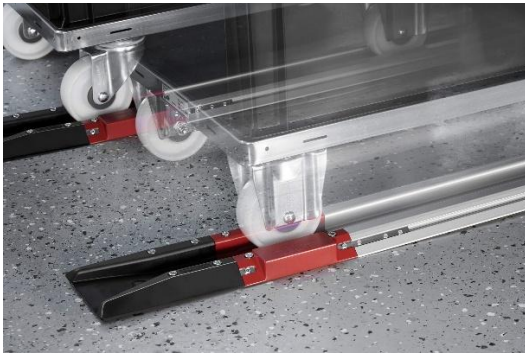
02 Wireless sensors detect containers, e.g. in eKanban racks, and transmit their signals via a Sensor Bridge to the company IT.



03 View from above: long-range sensors detect free parking slots in material supermarkets. Easily visible: the separate battery and wireless module.



04 Part of the replenishment management: laser sensors detect e.g. containers or fill levels.



05 Via robust wireless sensors developed especially for this use case, dolly stations can also be integrated in the automated requisition management system.



06 The "on-premise" version of sWave.NET® requires no additional hardware – i.e. no industrial PC.

(autonomous mobile robots) or dollies can also be integrated in the AMS (Fig. 5), as can transfer points between mobile and stationary conveyors. The result is an uninterrupted and real-time visualisation of the entire material flow, without having to monitor every single component individually. The infrastructure requires just a few elements which, if necessary, can easily and quickly be mounted in a new location – for example when the shop floor layout is modified or redesigned.

An additional benefit is that the system can be expanded to include extra functions. For example, it is possible to implement dashboards or to integrate command devices or indicator lamps. Preconfigured interface modules for various applications (eKanban, dolly monitoring, AGV integration) simplify installation and adaptation to individual use cases.

On-premise solution without own hardware

The sWave.NET® system described here is from the steute business division Leantec. It is primarily used in the automotive industry, but also in the assembly of electrical and electronics components and medical devices – and is continually undergoing further development. Recent additions include a "hardware-free" Sensor

Bridge as an alternative to the version previously requiring an industrial PC (Fig. 6).

This hardware-independent "docker only" version of the Sensor Bridge is interesting for companies keen on lean IT hardware with as few edge devices as possible and a correspondingly low administrative effort. They can still use all the sWave.NET® functionalities, but without having to install and manage an additional hardware component. The Sensor Bridge image can be set up and configured on the customer server with just a few commands. A dashboard provides operators with additional transparency concerning information and material flow.

"Misappropriation" welcome!

The features of sWave.NET® include an openness to potential new applications. (Semi-)auto-mated assembly can involve not only C parts, but also other non-inventory-managed material groups which have to be assembled, as well as packaging which then has to be removed from the assembly area. For precisely this reason, a pharmaceuticals manufacturer has installed the sWave.NET® system in an assembly line for injection pens as compact as it is complex. Wireless sensors monitor

New wireless switchgear series at the SPS

The wireless switchgear range from steute includes not only the here described network-compatible wireless sensors, but also switching devices for wireless point-to-point connection. Here steute will be presenting two new products at the SPS in Nuremberg.

A new wireless foot switch series uses a low-energy wireless system developed by steute, featuring a long range and achieving high transmission reliability even in often adverse industrial conditions (multiple radiation, coexistence with other wireless systems). In addition – compared to the previous series – energy consumption could be reduced by as much as 50 %. This is facilitated by long battery runtimes between charging cycles.



07 A new series of inductive wireless sensors with digital autocalibration is suited to both flush and non-flush mounting.

The steute wireless sensor range has been expanded to include compact inductive sensors with flexible switching points thanks to autocalibration: the sensors adapt their switching point automatically and dynamically to their environment. This makes them suitable for both flush and non-flush mounting, and they can also adapt to increasing contamination (e.g. metal shavings used in metalwork) (Fig. 7).

not only the parking bays for parts, but also those for empty packaging. The logistics experts along the assembly line are equipped with tablets which, as the "front end" of sWave.NET®, provide a graphic visualisation of which assembly stations need to be supplied with parts, and which need to have empty packaging removed. Here sWave.NET® docks onto the Agilox fleet management visualisation, which can easily be expanded to include such extra tasks.

Conclusion: a practical tool for optimising production

As this example shows: with a wireless-based AMS, users have at their disposal a practicable solution for IT-based and simultaneously remote-controlled production optimisation. The wireless network particularly has advantages for assembly processes because it visualises the material flow of non-inventory-managed components promptly and realistically. This guarantees needs-based requisition. (mh)

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Images: steute Technologies GmbH & Co. KG