Technical article, published in: FUTURE MANUFACTURING (10/2022)

Stock monitoring: remote materials requisition for efficient intralogistics

Uninterrupted monitoring of stock within the in-house material flow is a prerequisite if replenishments are to be needs-based. The usual enterprise resource planning (ERP) systems have some gaps which can be closed by opting for a remote automated materials requisition system.

A particular challenge in city logistics is the proverbial last mile. For in-house logistics it is often the last metre: a short distance within the material flow along which the stock levels of small load carriers or assembly components are not monitored – and that can be a problem.

Imprecise stock monitoring

During the assembly of supplier parts in the automotive industry, numerous containers or boxes of consumables are usually in circulation. These are not core components. Inflow and outflow are captured by an ERP system which then triggers replenishments. The problem:

In the assembly of automotive components, an automated materials requisition system monitors the occupancy of containers using wireless laser sensors.

steute Technologies GmbH & Co. KG
Brückenstr. 91
32584 Löhne, Germany
Phone: + 49 5731 745-0
Fax: + 49 5731 745-200
info@steute.com
www.steute.com

over time the actual quantities deviate increasingly from those calculated by the IT. One of the reasons for this is that several hours can elapse between assessments of demand, meaning that the positive stock balance difference can be high. In addition, only the demand at the assembly point itself is assessed. The ERP system does not capture any containers currently en route to that point.

This imprecision in stock management despite digitalisation has led some automotive companies to reverse the level of automation to some degree and employ staff as runners to monitor the demand or stock levels at assembly points. Or they have returned to traditional Kanban cards. Others have set up terminals in their assembly areas allowing materials to be requested according to the pull principle.

Creating an uninterrupted information chain

From an IT perspective, that really is a step backwards, and in practice is not usually ideal. Permanent relief can be provided, in contrast, by a remote automated materials requisition system. The basic idea behind this system is to equip not the boxes themselves, but the transport vehicles and storage sites or lanes with wireless sensors, and to span a wireless network over the shop floor. Using wireless laser sensors, this system captures the stock levels of large load carriers (LLC) or small load carriers (SLC) in the assembly area or the materials supermarkets. Wireless laser sensors can also detect occupancy levels inside the containers and request replenishments. Since these sensors transmit their signals by remote control, they are also able to monitor stock levels on moving units such as tugger trains or mobile eKanban racks.

steute Technologies GmbH & Co. KG
Brückenstr. 91
32584 Löhne, Germany
Phone: + 49 5731 745-0
Fax: + 49 5731 745-200
info@steute.com
www.steute.com

Access Points pass on the wireless signals from the assembly or shop floor to a Sensor Bridge, the interface to the ERP system.

The wireless system can assume additional tasks in parallel, such as the integration of Andon systems.

Special designs are also available, for example for monitoring dollies in monorail tracks or boxes in Kanban racks. Another application covers the transfer points between stationary and mobile conveyors, for example roller conveyors or automated guided vehicles (AGV).

High transmission reliability guaranteed

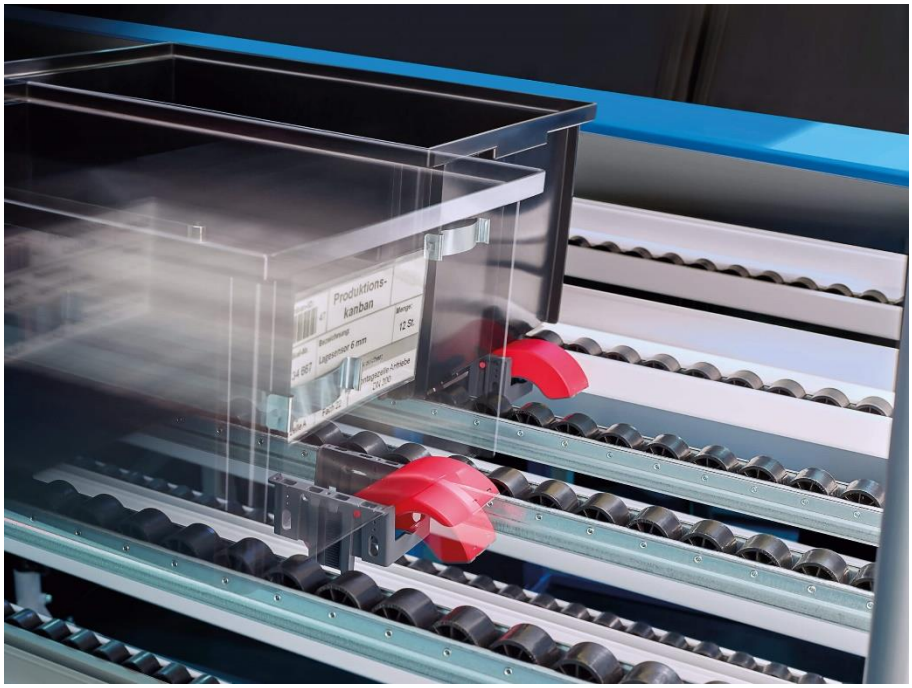
The wireless system has been adapted to suit the special requirements of industrial production. Even in adverse conditions it functions with high dependability and transmission reliability. The data collected remotely by the sensors are passed on directly by the Sensor Bridge software to an existing backend application for processing. Common industrial intralogistics applications, such as eKanban or AGV, are preconfigured, and different applications can be operated in parallel via a wireless platform.

This type of wireless-based automated materials requisition system has been successfully tried and tested and is now used by diverse automotive companies, as well as in the production of other goods, such as electronics components. Up to several thousand wireless sensors can communicate with the Sensor Bridge via Access Points, ensuring transparency in the material flow. In such cases the overall system is divided up into several smaller subsystems with a maximum of 1,500 sensors each, managing the wireless traffic within the company efficiently and avoiding data collision.

A key question arises when evaluating such an automated materials requisition system: is it cost-effective? The answer is most definitely yes, as exemplary cost calculations by steute Technologies GmbH & Co. KG have demonstrated. Taking different baseline conditions, the return on investment (ROI) period for their nexy wireless network was just a few months – even when retrofitting existing assembly lines. One of the reasons for the short

steute Technologies GmbH & Co. KG
Brückenstr. 91
32584 Löhne, Germany
Phone: + 49 5731 745-0
Fax: + 49 5731 745-200
info@steute.com
www.steute.com

The automated materials requisition system captures the position of containers within a rack using sensors.



ROI is simple implementation thanks to pre-configured applications, such as for eKanban.

Higher transparency, better control of material flow

The concrete benefit of a wireless-based automated materials requisition system which docks onto the ERP or production planning system consists in higher transparency and better controllability of the material flow. The wireless sensors capture all processes, also in and on mobile units, and facilitate a reaction in real time. The consequence is an improved, needs-adjusted material supply and a reduced error rate.

Automated materials requisition system increases cost-effectiveness

Moreover: a perfectly adapted inventory management system reflecting real-life operations reduces capital costs without increasing the risk of bottlenecks or production downtimes. And this is precisely where the main advantage of eKanban lies. The cost-effectiveness of such a solution can be further increased if the wireless system assumes additional tasks, which is easily facilitated, for example the integration of Andon systems or the automated transfer of materials to AGV.

Author:

Andreas Schenk
Product Manager Wireless
steute Technologies

Images: steute Technologies GmbH & Co. KG

steute Technologies GmbH & Co. KG
Brückenstr. 91
32584 Löhne, Germany
Phone: + 49 5731 745-0
Fax: + 49 5731 745-200
info@steute.com
www.steute.com