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Universal wireless network as a platform

PRECISION REQUISITION MANAGEMENT IN INTRALOGISTICS

"At one fell swoop" – this is the simplest way to describe the different ways of using a wireless network for requisition management. The nexy network assumes multiple functions and facilitates precise control of material flow in production, assembly and consignment.

Many companies producing complex and varied products have had an unexpected experience in the past: despite sophisticated material flow management, stock levels can become irregular because the numbers recorded by the system are increasingly unrealistic. This leads to an excess or at least incorrect inventory. This is partly due to the amount of time required to organise replenishments. High levels of stock are in circulation at any one time, in turn leading to increased space requirement for boxes in material stations and supermarkets.

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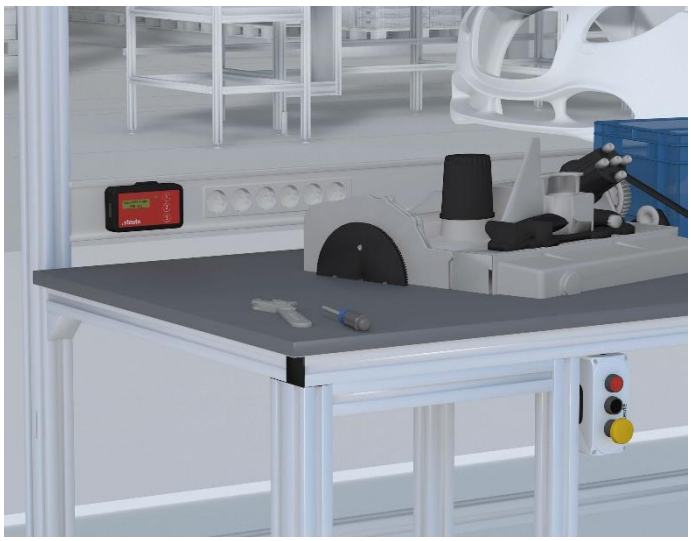
01 Robust wireless sensors provide transparency for material stock in dolly stations



02 Command devices can also be integrated in the wireless network – as a human-machine interface to the ERP system

Automated requisition is thus desirable – with the aim of reducing the delay between complete emptying of a box and the arrival of replenishments. This aim is achieved using a wireless network which docks onto the user's e.g. ERP, MES or WMS and enables all boxes to be precisely managed and tracked – across the entire material flow. This also includes boxes which are en route to their destination via AGV or tugger train, or which are located in mobile or stationary eKanban racks. This means: the requisition management system monitors articles and quantities not only at pre-defined counting points (e.g. in front of an assembly belt), but also directly at assembly points or en route to them. Controls are then more precise, and a faster automatic reaction is possible if, for example, the stock level of a certain screw at a certain assembly point is getting dangerously close to the minimum level. Manual re-ordering – as many installations have demonstrated in practice – then becomes a thing of the past.

REMOTE STOCK CONTROL

This is what the nexy system developed by the company steute actually does: the communication medium is a wireless protocol which guarantees a high degree of transmission reliability even in industrial environments (for example, other wireless networks or radiation). At the shop floor level, wireless sensors transmit and receive signals which are in turn received by Access Points and passed on to a Sensor Bridge. The Sensor Bridge assumes the function of an interface to the superordinate IT infrastructure. This ensures that nexy is completely integrated in the material flow at the IT level, functioning as an automated material requisition system.

A comprehensive range of wireless sensors enables nexy to realise many and varied functions at the shop floor and hardware level. In such cases, pre-configured software solutions for different tasks guarantee rapid implementation in conjunction with best possible adaptation to the individual conditions.

As a platform in the classic sense, the network can assume multiple functions simultaneously. This is possible because multiple clients can be

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stored and managed in the Sensor Bridge. All applications share the wireless infrastructure with the corresponding Access Points. The sensors and actors in the field, as well as the interface parameters, are always assigned only to the appropriate client. This facilitates the parallel operation of different applications and responsibilities within one production area with a single, uniform infrastructure.

THE PRACTICE

This benefit is exploited by the majority of users, who come from branches such as the automotive (supplier) industry, household white goods or the production of electrical devices (electrical motors, frequency converters). A short overview of some different applications will demonstrate what is possible and popular.

Requisition triggering and monitoring in dolly stations
Robust sensors detect the arrival and departure of dollies along the monorail tracks of material stations and supermarkets. On this basis replenishments can be ordered automatically. Manual monitoring of stock is no longer necessary. Moreover, buffer areas and quantities can be reduced.

Replenishment management for small load carriers
The position of small load carriers in mobile or stationary eKanban racks is detected via tilting sensors developed especially for such cases. In some applications, several thousand sensors facilitate within a single network the needs-based replenishment of assembly points with small parts. Cascading ("three boxes left, two boxes, one box…") is also easy to realise.

Semi-automated notification system
Command devices can also be integrated in the nexy system – as a human-machine interface to the ERP system. Operators can use them, for example, to send a notification that a consignment has been completed. Or to send a manual requisition note. This facilitates semi-automated logistics processes.

Monitoring of parking areas and occupancy of large load carriers
New additions to the nexy wireless sensor range include long-distance laser sensors. They can detect from a longer distance the presence of pallets in pre-defined parking areas within the material station, or they can detect the occupancy of load carriers and trigger replenishments via the nexy system.

Each of these described applications can be used as one module on a nexy platform and then be combined with other modules. In this way, users build up their own personal solution for uninterrupted stock control in material requisition management. Additional pre-configured applications are also available, e.g. for the integration of AGV fleets or transfer points between automated guided vehicles and stationary conveyor belts.

SIMPLE VISUALISATION, INITIAL OPERATION AND CONFIGURATION

Via the nexy platform, wireless sensors can also be logically linked to display instruments (warning lamps, screens). This increases transparency and process quality. In addition, logical functions such as "traffic light controls" (red/yellow/green) can be installed. Using a demonstrator, this will be shown by steute at the Motek 2023. At the fair, a configurable dashboard will visualise the current status of all components within the system in real time, and overviews can be provided on any number of monitors. The prerequisite for this is a standard browser. The Sensor Bridge provides control over the device infrastructure within the wireless network. With the web-user interface, the wireless sensors and actors, as well as the Access Points, can be managed, parameterised and configured. The same task can also be completed by users on site via an app. This shows how nexy continues to rise to new

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challenges – not least because its users are also recognising the potential of boosting the retrograde requisition process with a wireless-based eKanban system and corresponding sensors: high requisition reliability, reduced manual effort, reduced range, needs-based replenishment and inclusion of disturbances.

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