

Monitoring material flow in real time



A wireless-based system facilitates uninterrupted automated material requisition and can also integrate mobile transportation, such as AGV and dollies. This option is favoured by e.g. the automotive industry or manufacturers of household devices. Pre-configured applications simplify integration in existing IT infrastructures, and both new (wireless) sensors and new functions are currently available – including an "on premise" solution for the first time.

Despite well-established IT infrastructures, incorporating e.g. ERP or material requisition systems, gaps are often to be found in the flow of information over the last few metres of the replenishment chain, e.g. in the assembly of supplied automotive parts. The consequence: either (costly) surplus stock builds up, or supplies become insufficient, leading to delays in the production process.

This gap in the flow of information and material can be closed – using an automated material requisition system. The concept is simple. An industry-compatible wireless network is installed across the relevant parts of the shop floor, consignment or assembly areas.

The automated material requisition system next manages the replenishment of non-inventory-managed materials or components.

Different sensor types transmit signals into this network and communicate material stock levels or the presence of materials and/or boxes and other containers via the industry-compatible wireless protocol sWave.NET:

- Long-range laser sensors detect pallets.
- Spot laser sensors can detect the fill levels of large load carriers.
- Special tilting sensors register the removal of boxes from eKanban racks.
- Dolly sensors count dollies as they arrive and leave on monorail tracks.

Command and display systems, such as Andon buttons and stacklights, can also be integrated in the wireless system.

Uninterrupted information flow by remote control

Access Points in the field pass on the wireless signals from the sensors to the Sensor Bridge,



which then evaluates these signals, while also assuming the function of interface to the superordinate IT infrastructure. This concept has been successfully tried and tested in many different applications, not only in the automotive industry. Other fields include the production of components for mechanical engineering, drive technology and the electrical/electronics industry.

For specific uses, such as dolly stations or eKanban racks, pre-configured applications are available. Both the hardware and the software from nexy are continually being further developed, as current new features for the integration of dollies in the automated supply of materials and replenishments show.

New generations of wireless dolly sensors

At the arrival and/or departure points on the monorail tracks where dollies "park", wireless sensors register the movements of full and empty vehicles. They can trigger e.g. a requisition order in the IT system of the user (ERP, WMS, etc.) remotely and in real time.

The RF DSENS-NET sensors were developed especially for this application case. On the one hand, they need to be extremely robust, yet on the other hand very precise when detecting the arrival or departure of a dolly on a monorail track. This task is assumed by sensors which are well protected inside a robust enclosure.

This sensor registers the direction in which a dolly is facing, and its wireless ID assigns the dolly position accurately. The second-generation dolly sensors, which are as robust as they are precise, facilitate remote and reliable dolly monitoring in real time. Typical

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Part of the wireless requisition management: laser sensors detect e.g. boxes or, with the long-range variant, the contents of palletized goods or palletized containers.

application fields include material supplies to serial production from "supermarkets" and flow stations, as well as the management of

empty boxes or other containers. In combination with the other types of (laser) sensor presented above, the system can also detect containers being transported by dollies. The dollies are thus

integrated in the material flow or replenishment management.

Dolly applications with new functions

Dolly detection within the nexy wireless network has some new features at the software level. For example, the logic of the preconfigured dolly application has been

trained to give it a detection accuracy of virtually 100%, independently of operating or process errors or other imprecisions. These new functions were realised following close observation of nexy applications in practice. In existing installations, they can simply be installed with the next update and then be configured and visualised via the Sensor Bridge web interface of the nexy wireless network.

New infrastructure: Sensor Bridge for on-premise installation

At the hardware level, a new infrastructure is now available not only for dolly applications, but for all application areas within the automated material requisition system. This concerns the Sensor Bridge as the "brain" of the communication network. It evaluates the signals from wireless sensors in the field which have been bundled via Access Points. At the same time, it assumes the function of interface to the IT infrastructure of the user.

To date, steute provided users with an industrial PC (IPC) with a pre-installed Sensor Bridge. In cases requiring very high availability, the Sensor Bridge was supplied as a clustered

version with three IPC. Now users can also opt for a "docker only" version independent of hardware – as an on-premise solution for installation on their own IT platform.

This new option of a hardware-independent Sensor Bridge is interesting for companies looking for lean IT hardware with as few edge devices as possible and a correspondingly low administration requirement. They can still use all the nexy functions – but without installing and managing an additional hardware component.

Conclusion: increased requisition efficiency

With these new features, nexy is even better equipped to meet the (increasingly individual) requirements of its users – at the sensor level and also regarding functionality. In all cases, the use of a wireless-based automated material requisition system closes a gap in the information flow and facilitates higher supply reliability on the shop floor – also thanks to transmission in real time. At the same time, replenishment times for materials are reduced – leading to a considerable increase in requisition efficiency.

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