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Technical
article

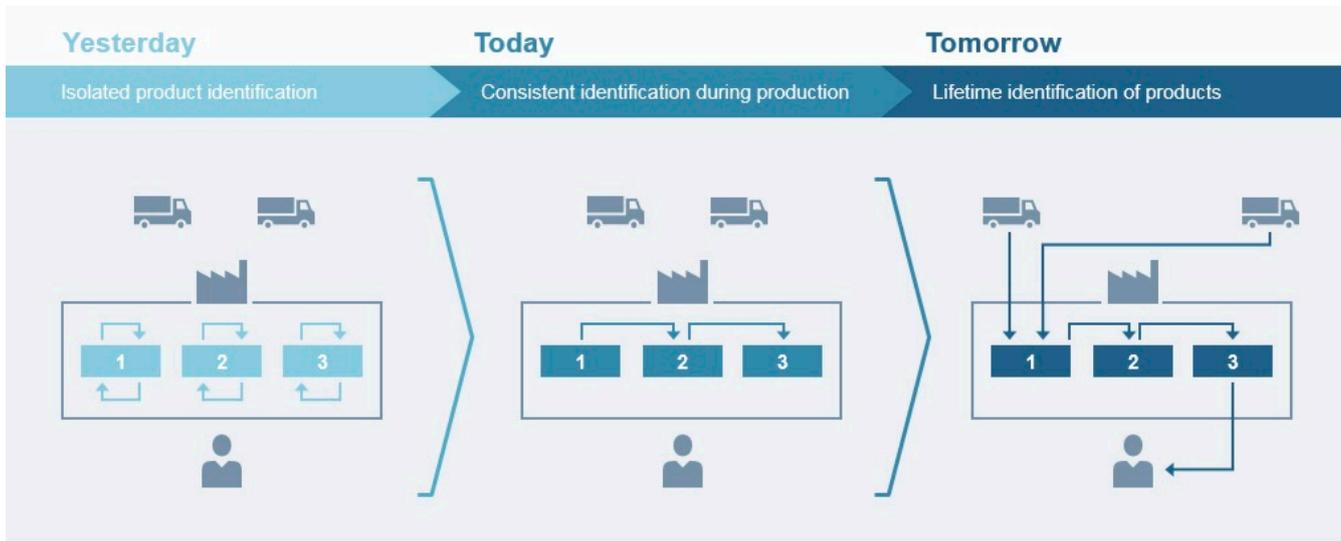
A photograph of an industrial forklift in a warehouse. The forklift is carrying a pallet of white plastic chairs. In the background, there are tall racks filled with various components, possibly light fixtures or electrical parts. The scene is brightly lit, and the floor is polished concrete.

Technology and trends for the industrial identification in intralogistics

Thanks to OPC UA, modern identification devices talk to the cloud and make brand-new approaches to automation in intralogistics possible

A number of technologies are known today for automating the goods identification in intralogistics: from optical barcodes to radio-based identification (RFID) to gapless radiolocation with centimeter accuracy (RTLS). In mixed operation, human- and machine-readable markings as well as RFID are used at the entrances/exits and RTLS for large areas. This combinability, however, brings with it new challenges, especially when it comes to the manufacturer-independent communication of the devices with higher-level IT systems.

Dr. Stefan Schwarzer, product manager for industrial identification systems at Siemens, knows a solution: „OPC UA can serve as a universal language that does not require specialized middleware, and whose data model is adaptable to industries and technologies through standardized Companion Specifications. For example, the AutoID Companion Specification exists for the automated identification of objects. This makes it possible for all providers of identification solutions to deliver a uniform interface.“ The data model is semantically contained in the data stream and is supplied together with the data, which facilitates the connection to target systems.



Streams of goods are increasingly being tracked across locations and companies; cloud systems lend themselves to the storage of data

The information security is firmly embedded in the „DNA“ of OPC UA and likewise standardized. Dr. Schwarzer explains the benefits: „This ultimately relieves us of some of the work securing the many proprietary protocols. OPC UA comes with everything.“

As a protocol, OPC UA can be implemented horizontally at the field level as well as vertically from the field level to the IT system level and even in the cloud. „This is of particular importance for intralogistics, as the communication between reader and automation technology at the loading/unloading station is just as necessary as the reporting of the identified goods to the MES system, be it on-site or in the cloud. One protocol can satisfy both purposes – this is unprecedented,“ says Dr. Schwarzer.



left: Selection from the SIMATIC RF600 family of UHF RFID readers; right: Selection from the SIMATIC RTLS family of radiolocation devices

This aspect is especially important for automated guided vehicles (AGVs) in intralogistics. RFID technology is used there as well, explains Thomas Hladik, AGV application expert at Siemens: „We utilize RFID in transport vehicles for precise navigation in large areas and for exact positioning during the material transfer. In addition, it ensures the reliable identification of the accepted goods.“

In any case, process reliability is an important keyword. RFID readers without intelligence report hundreds of reading events per second – thereby swamping IT systems, which rely on the reporting of individual posting and clearing events; a typical problem with this technology. The task of filtering and qualifying reading events is often assumed by so-called middleware, i.e., software in place between the reader and target system. „Software, nevertheless, needs hardware on which to run. Modern RFID readers can carry out this processing within the device – using industrial-suited algorithms for filtering and preprocessing the numerous reading events. We call our algorithms ‘UHF for Industry’ and standardly integrate them into our devices, which can be conveniently configured and diagnosed from a web browser,“ states Dr. Schwarzer. Only qualified reading events are then reported via OPC UA. Furthermore, digital inputs and outputs on the devices enable the direct connection of gates, light barriers and signal lights. Dr. Schwarzer states the benefits: „This saves time and money during the configuration and commissioning of the material transfer points in intralogistics.“

Moreover, for typical applications in intralogistics, there are ready-made RFID modules that feature a higher integration level than the readers alone. „Together with our solution partner Tagnology, we are offering the Arrow Gate, a logistics gate with up to eight antennas and integrated direction recognition. Delivered in a space-saving manner on a Euro-pallet and set up in two hours – a lot of experience has gone into its development,“ says Dr. Schwarzer describing the collaboration.

Which technologies are currently finding their way into intralogistics? Dr. Schwarzer explains: „When it comes to the use of data across locations, cloud systems represent an interesting alternative to traditional databases. With OPC UA, data is quickly and securely transferred to a cloud, where the streams of goods are made transparent. Industrial IoT gateways today still act as the link to the cloud should they not directly support OPC UA.“

Security information

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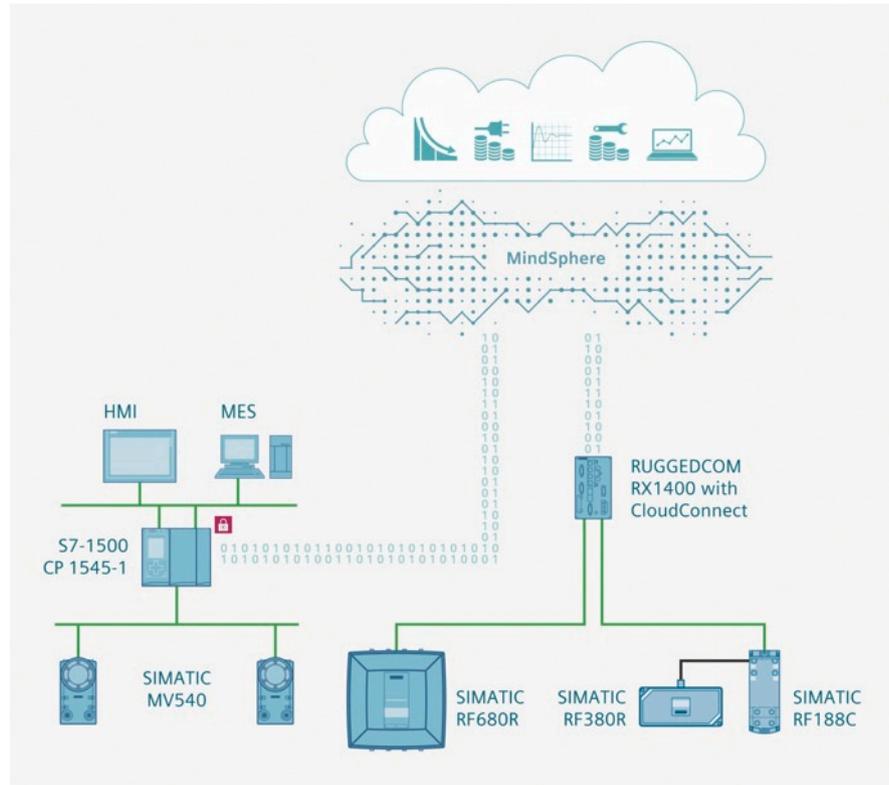
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SIMATIC Ident delivers data to cloud applications (using an Industrial IoT gateway – S7-1500 with CP 1545-1 or RX1400 with CloudConnect)

Once this solution has been introduced, the integration of suppliers and customers is quickly accomplished. The industrial IoT operating system MindSphere from Siemens ensures that data only gets to those permitted to have it – role-based and secured with the latest means. In addition to the traditional tasks of intralogistics, added value services such as data analytics can then also be performed – both historically and predictively.”

But there is also a real „new kid on the block“. Michael Metzler, at Siemens responsible for the global marketing and sales of the new SIMATIC RTLS product family, promises: „In intralogistics, real-time radiolocation RTLS enables the gapless location from the production floor to the logistics paths to the warehouse areas. Our customers often recoup their investment within a year.“

Siemens AG offers a broad product range of industrial identification, locating and communication technology for complete intralogistics solutions from the field level to the cloud. SIMATIC RF600, the UHF RFID reader family from Siemens, offers OPC UA, 'UHF for Industry' algorithms and convenient configuration and diagnosis via web browser. SIMATIC RTLS is an all-new industrial radiolocation system, the first one to be offered by a large industrial company. MindSphere, the cloud-based, open IoT operating system from Siemens, is a cloud solution tailored to industrial customers demanding maximum data security. The network devices of the SCALANCE series offer process-reliable networking of all components – with Industrial Ethernet and fiber optics, Industrial WLAN and mobile communications. Industrial IoT gateways from Siemens include the Ruggedcom RX1400 with CloudConnect or a SIMATIC S7-1500 PLC with CP 1545-1.