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SIMATIC Ident

Transportation in vogue

Future-oriented RFID technology ensures delivery of clothing consignments

Using RFID technology, a German ladies' fashion specialist has paved the way for problem-free deliveries. With the help of more than 6000 mobile data carriers, millions of individual items of clothing are prepared automatically for the correct dispatch route. The conversion in only two and half days is a model of perfect planning and preparation as well as simple handling and problem-free interaction of all system components.

To be able to work even more efficiently and improve performance in the future, the Gelco GmbH & Co. KG of Gelsenkirchen, Germany decided to renew and automate its most important internal goods transportation system with the aid of RFID (Radio Frequency Identification) technology. The central overhead system that was always controlled using non-contact readable data carriers connects the incoming goods department and the order picking warehouse via a bridge between buildings, and this in turn with the outgoing goods department. It is therefore essential to allow the fashion specialists to be able to make their deliveries. On some 6000 trolleys (these are mobile clothes rails approximately one meter long mounted on rollers), presorted coats, jackets, blazers, dresses, skirts, trousers and blouses intended for customers are transferred to this overhead system in a central transfer station.

The destination is specified manually on one of five I-point PCs. From here, the system transports the trolleys automatically to one of three stations located on three floors. There, they are put together as consignments for different haulage contractors and then transported at the correct time in the opposite direction via the overhead system to the outgoing goods department.

Depending on the group to which the products belong, each trolley can carry between 20 and 50 items of clothing and is equipped with a mobile data carrier. Before each routing point or group of routing points, there is a write/read device that identifies the trolley number as it passes so that the controller can check the stored destination and automatically set the routing points.

Requirement: Extremely tight deadline

Since every day counts in today›s fashion industry, the conversion had to be achieved in a maximum of three days over a weekend. This meant precise planning and extensive preparation was necessary as well as simple system components that could be installed quickly and that would then operate reliably under any circumstances. That this would be a solution with the latest and therefore future-proof RFID technology and automation technology from Siemens soon became clear.

During their search for the specialist knowledge and the components they required, the ladies› fashion concern found the EmBeWe company from Bad Münstereifel, Germany. The equipment supplier has been implementing individual automation and drive solutions for many years now for the widest range of sectors and applications from general plant engineering or the automobile industry right through to the foodstuffs sector. After clarifying the tasks in hand and the requirements, the RFID specialist consultants from Siemens in Essen were called in to help implement practicable solutions together.

Total package from one source

A combination of SIMATIC S7-300 head controller with a CPU 319-3 PN/DP with PROFINET capability and the SIMATIC RF300 RFID system won over the equipment supplier and the user both in terms of the technology and economics.

There were numerous arguments for this: The high-frequency RFID system with SIMATIC RF380R write/read devices (readers) and maintenance-free mobile data carriers (tags) SIMATIC MDS D160 allow read distances of up to 80 millimeters.

This leaves adequate room for maneuver even in bends and when there is strong vibration of the trolleys so that damage to the data carriers during normal transportation can be as good as excluded. The high data transmission rate of the HF system of up to 8000 bytes per second is more than adequate for the speed of the trolleys at approximately 10 m/min. Simple, successive mounting of the data carriers and the corresponding spacers was also very important. The spacers are secured to the trolleys with only one screw and the data carrier is simply pressed in. In view of the large number of data carriers required (approximately 6000), the low costs per carrier, of course, also played a significant role.

One of the main reasons for selecting a PROFINET / Industrial Ethernet solution was that many bus nodes can be connected simply and that end-to-end, fast communication over long distances is possible without great effort (repeaters). By using plug-in or screw connectors and preassembled cables, almost the entire networking could be pre-installed while the facility was still in operation and then commissioned very quickly in the hot final phase. All 14 RFID readers and eight PROFINET SIMATIC RF180C interface modules could also be installed in advance. The fast installation and commissioning was also helped by the use of push-pull terminal blocks, that can be integrated in the overall system very simply with two RJ-45 jacks. The Ethernet data is stored on the terminal block making replacement of a carrier module and maintenance easier and therefore reducing downtimes.

Simple to install, rugged and cost-efficient:
Mobile data carrier SIMATIC MDS D160 (on the left) in the spacer on a trolley. The read distance to the SIMATIC RF380R reader (on the right) can be up to 80 mm

The link between the RFID readers and the central controller is provided by PROFINET communications modules SIMATIC RF180C – here with the particularly easy to install push-pull terminal block with two RJ-45 jacks.

EmBeWe had also prepared the new cabinet and intensively tested the entire software with all PCs, the controller and several interface modules, readers and data carriers in a test installation in their own facilities. This meant that everything could run according to the planned steps on site. A further fact that simplified matters was that both the old and new SIMATIC controller communicate with the IO via 32-channel input output modules. The existing teleservice adapter for remote maintenance could also continue to be used.

Efficient engineering with TIA and function block

The equipment supplier was able to gain more time with the help of the end-to-end Siemens solution TIA (Totally Integrated Automation) in the engineering and programming: On the one hand, the software developer benefited from being able to program in the Structured Control Language (SCL) in SIMATIC STEP 7. «Without this, it would have been impossible to implement the complex data storage and management in such a short time», explains David Daniels of EmBeWe who created the software and led the commissioning on site. On the other hand, Siemens have developed a convenient function block (FB45) for programming their RFID systems and this significantly reduces the effort required. This function block provides the SIMATIC S7 user with an easy-to-use interface with commands for integrating the RFID components and for communication.

Problem-free operation faster than planned

«Thanks to all these functionalities and the intensive preparation, the new automation solution was installed on site in only two and a half days. It is been operating problem free since the end of June 2012 and has been further optimized in the meantime», adds Lutz Bonat, head of logistics for finished products at Gelco.

«With the latest RFID and control technology we were able to assure our delivery capability long-term», says Dirk J. Dreier, managing director and a member of the family that owns the company. The new systems will be operating reliably for years and there will still be spare parts available for many years to come.

Ladies' fashion for Europe and the world

The family concern Gelco is based in Gelsenkirchen and can look back on more than 60 years' tradition in the design and marketing of fashions for ladies with high quality expectations. The approximately 50 member strong design team develops its ideas for the right fashion at the right time from intensive market observation and numerous trade fair visits. Gelco has been producing clothing outside Germany since the 70s and coordinates marketing centrally from Gelsenkirchen. In co-operation with the retail chain Biba acquired by the Escada group in 2009, the Gelco group now has more than 500 of their own shops both in Germany and abroad and delivers fashion to more than 2500 partners worldwide. In total, the group has more than 1800 employees, 220 of these at head office.

Efficient automation and drive solutions from the Eifel

The EmBeWe GmbH from Bad Münstereifel, Germany offers extensive services in the industrial control and drive technology sector. The company plans, develops and implements hardware and software for complex machines and production plants as well as building switching cabinets. It supplies and installs the required electrical/electronic components, commissions the systems and creates the required documentation for them. On request, EmBeWe also handles the maintenance, repair and optimization of existing systems.

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