



# Your fellow robot on the WLAN

Unproductive work steps are cost drivers in the production. The Bierbaum Group has tackled this problem by assigning in-house transport tasks to a new generation of automated guided vehicles. This is an interesting step towards Industry 4.0 and an ideal application for a wireless communication environment.

The Bierbaum Group is among the most successful textile companies in Germany and has its headquarters in Borken. The company employs 490 people, who generate sales of EUR 112.5 million (2016). The two focus areas of the Bierbaum production are technical non-wovens and especially bed linens. The latter is marketed under brands such as Bierbaum Wohnen, Irisette, Strenesse, and numerous store brands. "Thanks to increasing automation, the production of textiles in Germany will be economically interesting again," believes Dipl. Ing. Jan-Frederic Bierbaum and adds: "By all means, Industry 4.0 is no longer fiction. The fully automated production is within reach".



Textile printing: Bierbaum prints 25 million linear meters per year.

### Robots instead of manual work steps

An example of the factory of tomorrow is demonstrated by Bierbaum at the Borken plant's textile printing operation. The colors needed for printing the textiles are mixed in their own dye kitchen and provided in plastic buckets. In the past, numerous employees were involved in picking up these buckets and bringing them to the four rotary printing presses. But "such activities are not a good use of human resources," believes Jan-Frederic Bierbaum and set out to find a future-proof alternative. This alternative was realized in cooperation with InSystems Automation. The Berlin-based automation specialist for production, material flow, and quality testing suggested the automated guided vehicle (AGV) proANT.

### Future through digitalization

The company therefore heavily invests in digitalization and is constantly working on further automating its production. The result can already be seen today. For instance, only relatively few employees are directly involved in the production processes at the Borken plant. During the fully automated assembly, entire pillow and duvet covers are cut and sewn, and even the zippers are put in without human intervention. Bierbaum points out a decisive advantage that a production in Germany brings about. "In the Far East, there is not just a completely different awareness of quality than we are used to. A lot of work is also still done by hand, sometimes under problematic conditions," he explains. "What's more, the environment is treated quite carelessly. And no one can check with which colors the bed linens are printed or what kind of toxins are contained in the textiles." Bierbaum not only focuses on bed linens made from 100% cotton. The company also tests its products for harmful substances in accordance with the OEKO-TEX® Standard 100. And only European chemicals meeting German standards are used.



proANT transport robot with IWLAN antenna: the automated guided vehicle is designed for loads up to 200 kg and communicates wirelessly.

The compact and maneuverable transport robots independently approach the transfer station of the dye kitchen, where – after successfully docking – a powered roller conveyor is activated, which then transfers a paint bucket to the transport system. At the transfer stations of the individual printing presses, the same process takes place in the reverse order. In doing so, not only are full buckets delivered, but also empty ones returned to the dye kitchen.

### **Flexibility through wireless communication**

The proANT robots are of course seamlessly integrated into the process automation of the plant. The color needed for a production batch is made available in the dye kitchen and requested by the employees at the printing press exactly as required. This request also triggers a movement task for the next available robot, which then responds completely autonomously and moves to the transfer station of the dye kitchen. In order to communicate with the robots moving freely in space, Bierbaum for the first time set up a WLAN. The robots

were equipped with SCALANCE W734-1 RJ45 Client Modules from Siemens. These Client Modules are characterized by a very compact design and have been specially developed for a reliable operation in demanding industrial environments. The integration of the robots into the production data network takes place via a secured wireless communication with transmission rates up to 300 Mbps (gross). Apart from the software for the order control, the system also communicates with the fleet management server, which is operated via a GUI (graphical user interface). The fleet manager monitors the state of the vehicles and provides them with the navigation map, which likewise is created and edited in the GUI.

Bierbaum project manager Daniel Kock comments: “The four robots are actually only the beginning. We are convinced that there is great potential in this AGV solution. In the foreseeable future, all transport operations at the plant will be carried out through such systems”.



Docking process: the exact positioning of the automated guided vehicle at the transfer station is crucial in order for the proANT robot to automatically receive the paint buckets.

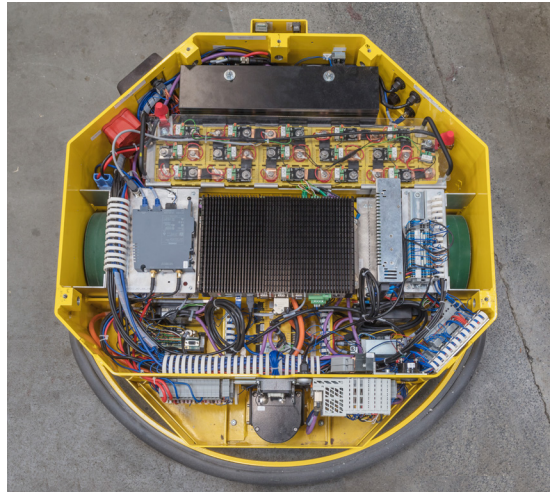


Your fellow robot at work: the color is on the way to the textile printing. The likewise automatically controlled roller conveyor accepts the load.



### **proANT as an intelligent solution**

Automated guided vehicles such as proANT not only recognize people and objects that stand in their way. They are also able to drive around obstacles on their own. They can even find a completely different route if one should be blocked. In doing so, they are absolutely safe for people and can work with them without problems. If an obstacle appears in the field of vision – no matter whether it is a parked pallet or a person – the robot slows down and either navigates around the obstacle or stops. “The material flow with proANT transport robots fits into the existing production of Bierbaum and could be put into operation without any structural alterations,” underscores InSystems project manager Lennard Held the decisive advantage. While previous systems were usually dependent on induction loops in the ground and thus could only follow a rigid, predetermined route, the proANT robots are a decisive step towards Industry 4.0. They orient themselves with the aid of a laser scanner, which scans the existing contours of the factory building – such as walls, columns, and other fixed installations. In the first initialization run, the scanner maps its surroundings and is then able to navigate – completely independently – to the instructed destination. “We are currently in the optimization phase,” remarks Jan-Frederic Bierbaum on the state of development. “We view such automated guided vehicles as a key tool for eliminating nonproductive work steps.”



Compact SCALANCE W734-1 Client Modules inside of proANT

## Security information

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Published by  
Siemens AG

Digital Industries  
Process Automation  
Östliche Rheinbrückenstr. 50  
76187 Karlsruhe, Germany

PDF  
Reference  
FAV-198-2017-PD-PA  
PDF 1022 5 En  
Produced in Germany  
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He is convinced that new automation technologies and a seamless wireless communication infrastructure will make it possible again to produce where the demand is. And he thinks it is a misconception that automation inevitably kills jobs: "In sum, no jobs are lost, but a higher efficiency is achieved while simultaneously lowering costs. We can now produce in Germany for less than in the Far East".

The SCALANCE W770 Access Points and SCALANCE W730 Client Modules in the SIMATIC design enable a reliable wireless communication between the SIMATIC S7-1500 controller and SIMATIC ET 200SP. Both simple machine networks and large wireless coverage areas with data rates up to 300 Mbps can be realized. The SCALANCE W770 Access Points and SCALANCE W730 Client Modules are optimally suited for the space-saving integration in the control cabinet.

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