

Ready for the Islands

Automotive supplier EuWe identifies workpiece carriers on the manufacturing islands of a production machine for rear vents with Turck's BL ident RFID system

For EuWe, the compact rectangular design is a decisive benefit of the Turck read/write head

The list of reference customers of the EuWe Group reads like the Who's Who of the automotive industry: General Motors, VW, BMW, Mercedes-Benz and Porsche are all listed – and those are only the most illustrious names. Whoever supplies the most demanding customers in such a competitive sector as the automotive industry must have done a few things right over the course of its corporate history. The quality must be right, as must the price. Last but not least, production and other internal processes must be organized so that they meet the requirements of ISO/TS 16949:2009, as stipulated by automotive manufacturers.

The group supplies automotive manufacturers and suppliers worldwide with high-tech plastic products. These include interior trims, central consoles, trunk trims or also functional components. For example, this includes rear vents, which ensure that the pressure produced when a door is closed or an airbag is triggered, can escape from the vehicle in a controlled manner. The components are provided with flaps that

release the air pressure in the event of a pressure increase and remain otherwise closed so as not to let in any outside air.

Rear vents for BMW

In 2014, EuWe started to expand the existing production with another special machine for manufacturing rear vents for BMW. The system was called island manufacturing since it consists of several individual manufacturing islands. An injection molding machine for producing the blanks is located at the beginning of the process. A robot puts four workpieces each onto a workpiece carrier, which moves on a conveyor belt to the first processing station. Here a robot puts four flaps on each of the four workpieces, which are then fixed to the semi-finished product using ultrasonic welding.

A camera at the next station checks for welding faults before the four workpieces are turned. Faulty parts are ejected here directly and replaced with good parts. At the last process step, a robot applies sealing

QUICK READ

Linked production processes in special machines have disadvantages: A stop at one station results almost immediately in the shutdown of the entire machine. Intelligent buffer sections can ensure a continuous flow of production but can mostly only be implemented effectively with the identification of the workpieces. Automotive supplier EuWe Eugen Wexler GmbH & Co. KG has implemented this in a new production plant for rear vents – with Turck's BL ident RFID system.



foam to the turned vents. For this a single-track material carrier guide turns into a twin-track one in order to prevent any jams. The last process step involves a complex visual inspection of the foamed seal. A camera with special lighting on the robot arm checks here the shape, consistency and volume of the sealing foam.

Disadvantages of the linked system

When the plant was planned, the question was also raised as to the most suitable method of identifying the workpiece carriers in the process. Automation technician Robert Ullmann had already gained experience in the identification of workpiece carriers in an existing plant. In the previous plant, EuWe had implemented a linked system using conventional proximity switches. When faults have to be documented, the controller virtually counts along, assigns the information on faulty products to the individual workpiece carriers and discards faulty products. However, the chain of workpiece carriers could not be interrupted. This was the biggest disadvantage of linked systems. A buffer section that can compensate for delays in the process is not possible. If a production step comes to a standstill, the production jams up in front of this station. Production islands behind the jam have to stop as the parts required are missing.

Due to this experience, Ullmann also recommended the implementation of a workpiece carrier identification system with RFID for the second rear vent production plant. "We reflected on what we could do better



Robert Ullmann is convinced of the benefits of RFID: "The new machine has a faster production rate and also requires fewer manual interventions by employees"

than the last time. On the existing machine we saw which benefits an RFID system could bring us. The new machine has a faster production rate and also requires fewer manual interventions by employees."

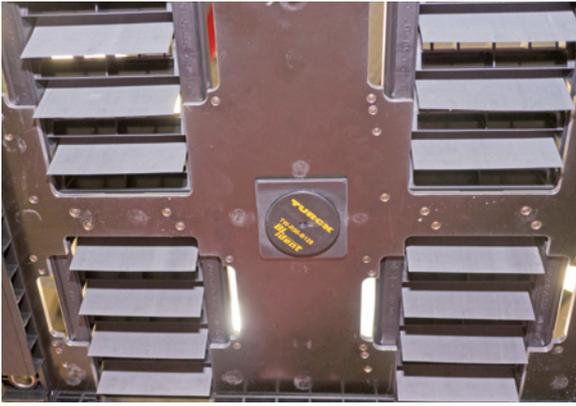
Compact design simplifies mounting

"We looked at another RFID supplier besides Turck. However, this supplier only had RFID read/write heads in a cylindrical design in its range," Ullmann describes one of the reasons for choosing Turck. EuWe uses a

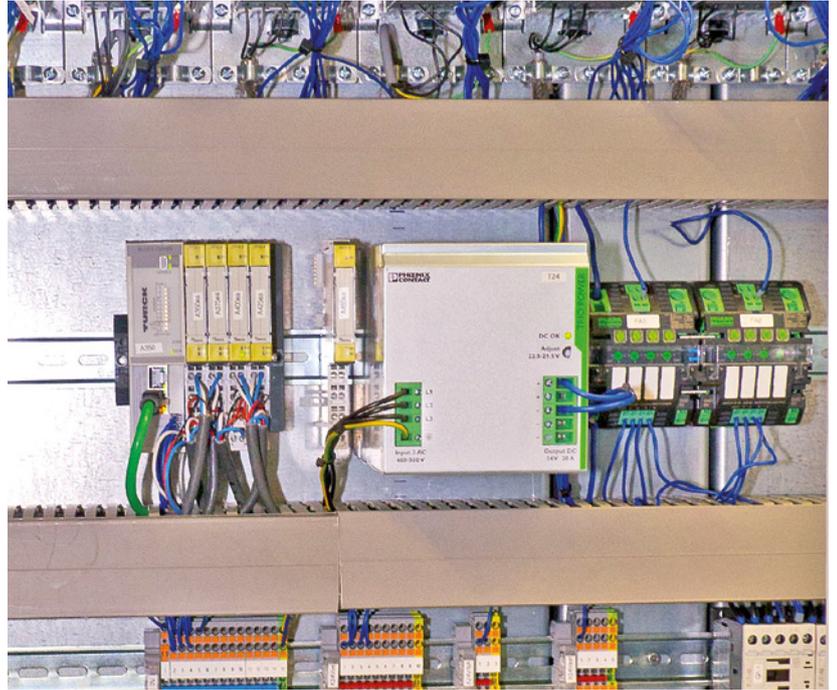


»The integration of the Turck RFID system in the controller was very easy. We didn't need to integrate any special program blocks in the PLC software in order to translate the RFID language into the language of the controller. I could operate the interface of the controller directly.«

Robert Ullmann | EuWe



The view from below onto the workpiece carrier shows the centrally mounted tag and the four rear vents with the flaps



The BL20 gateway in the control cabinet brings the RFID data via Profinet to the controller

very compact RFID read/write head from Turck: The flat rectangular TN-Q14-0.15-RS4.47T read/write head can be mounted optimally in the middle of the fixings at the production islands. A cylinder could not have been used here since a metal cylinder is already located there. The positioning at another location of the material carrier would have been more difficult. The circular TW-R50-B128 tag was mounted centrally on the material carrier.

Simple integration in the controller

“The integration of the Turck RFID system in the controller was very easy. We didn't need to integrate any special program blocks in the PLC software in order to translate the RFID language into the language of the controller. I could operate the interface of the controller directly. The information is simply written to the PLC output and then lands on the workpiece carrier,” Ullmann praises the integration of BL ident RFID in the Siemens S7 controller. The automation engineer knows from previous projects that other systems demand the use of these program blocks.

The RFID system identifies each workpiece carrier in the process eight times. The PLC writes faulty processing steps to a database which links the entry with the corresponding workpiece carrier and the position of the rear vent on the carrier. The data reaches the S7 controller via Turck's BL20 multiprotocol gateway and Profinet.

If a process is running incorrectly, this is detected and documented during the process or in a subsequent check. With ultrasonic welding, for example, the welding machines detect whether the necessary depth for optimum welding was reached. This is followed by a visual check, for which the results are documented in exactly the same way as in the final check after the seal is sprayed on.

More efficient plant with RFID

The result of seamless workpiece carrier identification is a flexible system with a faster production rate and also requiring fewer manual interventions by skilled personnel than with systems without identification. “The new system would also enable us to make variant changes on the fly. This is not planned as yet, but with the appropriate change of tools it would be easy to implement from the RFID system,” Ullmann explains.

All stations and the corresponding workpiece carriers can be displayed on the user interface of the S7 controller. If faults frequently occur at a station, this can be traced via the visualization. EuWe is not tracing at present whether specific workpiece carriers frequently produce faults. However, Robert Ullmann can imagine the integration of this option for the next machine of this kind.

The fact that this kind of island production has to be built next is entirely possible. After all, Lauf an der Pegnitz is ultimately the central special machine manufacturing site for the entire Eugen-Wexler Group. The plants in the Czech Republic, Mexico and from 2017 also the new plant in the USA will benefit from the experience that the colleagues in Lauf have in the construction of special machines.

Author | Achim Weber is sales specialist at Turck
User | www.euwe.com
Webcode | more11550e

The read/write head is mounted in the middle of the workpiece carrier fixing

