

# RFID in the Body Shop

With its UHF-RFID system Turck demonstrates the benefits of its long-range identification solution at an automotive manufacturer in China

**A**t present, the global auto industry is changing dramatically. The emerging market represented by "The BRIC Countries" (Brazil, Russia, India and China) is rising sharply, reforming the pattern of the global auto industry and market. According to incomplete statistics, "The BRIC Countries" have made contributions to over 40% of the growth rate of the global auto market in recent years, and the increase rate of corresponding productivity reaches approximately 55%.

As an important part of the global auto industry, the China auto industry has experienced development and has taken a giant leap. The global auto industry will spread to China and some emerging economies. This is a big historical opportunity for the Chinese auto industry.

At present, the China auto market develops rapidly, and the automobile consumption demands change form flexible production dramatically. In such circumstance, the introduction of the RFID system becomes very important.

## Intelligent body shop conveying system

The body shop belongs to line production. The production line is a strip, long and highly automatic, and the production efficiency mainly depends on the conveying line. The conveying line is like a blood vessel that runs through the whole body shop. The body shop is divided into lower body line, side body line, main body line and adjusting line according to production process. A highly intelligent mechanical conveying system is used to connect various parts, forming the equipment system of the entire body shop.

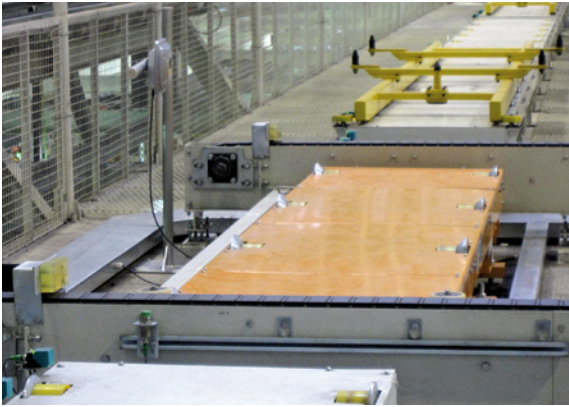
Normal operation of the mechanical conveying system is a prerequisite for production of the entire body shop. Therefore, a highly automatic mechanical conveying system that runs efficiently and continuously is required to link all processes.

In China, Turck is active on the market not only as a manufacturer, but also as a system integrator company. After fully engaging with clients, Turck recommended the use of UHF RFID products in protection class IP67,

The UHF-read/write head TN840/920 reliably captures the data carrier on the car body



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**The body parts on the rail are later reliably captured by UHF-read/write head**

successfully meeting long-distance read-write and multi-vehicle type in-line production needs of the clients. The control system includes Turck's BL ident UHF series, a S7 400 PLC and the fieldbus protocol Profinet.

The PLC controls the entire system and ensures continuous operation of the system. The fieldbus is a Profinet network, connecting all RFID substations in the field. Interface modules in the neighborhood can execute all writing and reading processes under control of the control system, and transmit data in carriers into the control system through the bus.

### Optimized welding processes

Welding is an important link among four major processes of car production and features in complicated equipment and rapid production. Therefore, improvement of conveyor efficiency of the production line and reduction of waiting time of the production are key factors for ensuring output of a single shift and reducing production cost.

The introduction of the RFID system solves these problems for clients. By mounting UHF labels on the car body and writing related information about the car model, the production line can know the specific location of each car model in real time, so the conveying line can automatically and efficiently classify cars according to models and convey the cars to different production stations.

The ground production line is informed of preparing the corresponding welding parts in advance through reading information on the labels of five to six cars that are going to enter the ground welding line. This method greatly improves continuity of the entire production line and reduces waiting time of the ground welding process.

Moreover, information systems of various shops of the auto manufacturer are relatively independent before, and the exchange of a great amount of information is required when car parts are conveyed among shops. With Turck UHF labels on car bodies, data carriers pass through all shops along with the car bodies, thus ensuring consistent car information in production links, avoiding the step of transmitting information among car bodies, greatly simplifying the operation process and improving production efficiency.



**Turck's BL67 gateway transmits the data via Profinet to the PLC**

Turck HF (High Frequency) RFID products are suitable for environments requiring read/write in a short distance, while carriers are mounted on conveying tools such as slides, lifting appliances and trays to read/write repeatedly in a closed loop. Turck UHF (Ultra-High Frequency) RFID products are suitable for environments requiring read/write in a long distance, while carriers are mounted on conveying tools, car bodies or products to be produced to read/write.

All in all, aiming at automatic identification systems in the auto industry, the fieldbus technology-based Turck BL ident series of RFID products in IP67 have a broad application scope in processes such as punching, welding, coating, assembly and engine production.

First, Turck owns interface modules of various protection classes (IP69K, IP67, IP20) which are well adapted to various field environments. Second, all BL ident series modules support hot plug and HF and UHF read-write heads can be mounted on the same interface module. Third, a single station supports eight channels and can be also compatible with I/O modules for digital and analog signals. Fourth, Turck supports fieldbus protocols such as Profibus-DP, DeviceNet™, Ethernet Modbus-TCP, Profinet and EtherNet/IP, and matches programmable gateways optically. Fifth, Turck owns various carriers (metal surface mounting, high temperature resistant, etc), meeting mounting requirements of clients in various working circumstances.

In short, profiting from excellent performance and prominent features of Turck's BL ident series of RFID products, the body shop mechanical conveyor system is further optimized and improved in stability, reliability and efficiency during running, beyond the expectations of clients. ■



“Turck's UHF BL ident solution enhances efficiency and implements flexible production.”

**Jixue Liu,**  
Turck (Tianjin) Industrial  
Engineering Co., Ltd.

### Quick read

If workpieces must be equipped with data carrier, RFID technology in the UHF frequency band is required. Turck has equipped an automotive manufacturer in China with its RFID-system. Since the data carrier is directly attached on the body, the production will not only be optimized in the body shop, but also in subsequent process steps.