

# Transparency Enhancer

RFID system BL ident guarantees efficiency during the production of sodium glutamate

**N**owadays RFID is widely applied in industrial production as well as in logistics and warehouse management all over the world. Chinese companies are using this technology to create more transparent and efficient processes. This was the reason that a significant Chinese company in the food industry applied RFID technology to the raw material processing, production, storage and transportation to trace materials and improve production efficiency.

## Requirements of the customer

The company produces sodium glutamate with the most advanced processes and technologies. The flavor enhancer is called "Gourmet Powder" in China. The food producer emphasizes modern and reliable but also cost-saving technology in their warehouse management. More precisely: they wanted to implement a real-time material management system that allowed

the tracing and control of the raw material transfers via RFID technology. The system has to evaluate the information from the warehouse data list and assign the single pallets to material stocks. Then the data is written by a combined read/write head via RFID onto the data carrier that is attached to the pallet.

Next, the PLC automatically assigns warehouse areas to the pallets and guides the forklift to store the materials at the corresponding locations. The forklift, which is also equipped with a combined read/write head, saves the location and the product information from the data carrier in the central system.

To guarantee a high availability, the system is operated with redundancy built in for central and decentralized data. For the outbound process, the First-In-First-Out (FIFO) principle applies. The system automatically guides the forklift to carry the materials to the corresponding production lines according to the production tasks. During the transport, the read/

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Each pallet is equipped with a resistant RFID data carrier at the middle bridge

The Chinese food producer uses Turck's RFID system for the control and the tracing of the whole material flow

write head at the forklift checks the data carrier on the pallet to determine if the material is really required. If there is an error during warehousing, outbounding or carrying materials to the production line, the system gives an alarm and automatically indicates what measures need to be taken to restore the system. The pallets are recycled during the whole warehouse management process.

## Digitalized pallets

The RFID tags are already integrated into the pallets. Compared to the traditional pallets with bar codes, the digitized pallets make it easy to implement a precise digital management for large quantities of goods. The workers do not need to print lots of bar codes in advance, stick them onto the pallets and scan them with a bar code gun. For the tagged pallets all this takes place during one read/write procedure.

The RFID tags can also be applied in harsh environments. This is because scratches and stains on their surfaces don't affect them as they affect a bar code. Tags are recyclable and can be used during rain as well – contrary to common barcodes. Additionally the specific tag UID improves the precision of the material tracing.

The production of sodium glutamate takes place under humid production conditions. The powdery raw materials are stored separately from the production because they need a dry environment. The system has to be able to work perfectly in dry and dusty conditions as well as in a humid environment. That is the reason the company uses Turck's BL67 fieldbus gateways with the RFID module BL ident in IP67. It is attached to the forklift and, due to its IP67 rating, it is able to operate in both environmental conditions. As tradition in the food industry, tags in IP68 are needed because raw materials come into direct contact with the pallets. A BL ident read/write head that is attached to the forklift allows reading and writing to occur during transport.

## Wireless forklift connection

The biggest challenge of this project was the connection of the gateways at the forklifts to the controls. Since the forklifts move around it was impossible to connect them with cables. After several discussions and experiments, Turck suggested a wireless Ethernet network that allowed the communication between the programmable gateways and the control level. This solution met the requirement of the customer to implement a real-time management for the whole logistics of the production system and the life-cycle management of the products.

The technical department of Turck (Tianjin) Sensor Co. Ltd was the system integrator of the project. Project leader Li Jiakuan summarizes the advantages of BL ident: "The shape of the read/write head from Turck is identical to that of the proximity switch, which makes them flexible to use and easy to install. In addition, the tags can be read and written to a capacity of 200 bytes while driving by and the 0 to 200 mm read/write



**The read/write head at the forklift collects the data of the pallet and forwards it wireless over the BL67 I/O system to the PLC**

distance absolutely meets our requirements. Together with the prefabricated connection cables of 50 meter length, Turck was able to provide a robust RFID package, which guarantees a reliable data transfer even under harsh environmental conditions. Furthermore the wireless network could be implemented with few gateways and network nodes without any problems." ■

### Quick read

Storage and production environments of sodium glutamate have to meet different requirements. Turck's RFID system BL ident can be used optimally in both environments, the dry one at the warehouse and the humid one during the production process. This guarantees transparency during the whole production and logistics chain, from storage and outsourcing of the raw materials, over the production process up to the storage of the finalized sodium glutamate powder.