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RFID Brings Visibility to Water and Snow Sports Company

A Taiwanese water and snow sports equipment company has boosted its manufacturing efficiency with a UHF RFID solution that tracks products through each step of the assembly process and as they are then shipped to customers. With the technology, provided by EPC Solutions Taiwan, the company can

track production data regarding each ordered product, as well as monitor worker efficiency and warehouse inventory levels, explains Rock Chen, EPC Solutions' engineering manager. The system also ensures that errors are not made when products are packed and shipped to customers.

The company has asked to remain unnamed. It makes paddleboards, surfboards, snow sleds and other equipment for consumers worldwide. This past April, the technology was first installed for two of its product lines: surfboards and snowboards. Based on that deployment's success, the firm now intends to expand the system's use to other production lines in order to increase assembly speed and accuracy across all of its products.

The company's 75,000-square-foot building includes manufacturing and warehousing areas. The firm is growing, and output from its facility has been increasing, requiring greater efficiency in its production processes. As more products are shipped out of the facility, the risk of shipping mistakes, such as a missed product or an item being sent to the wrong customer, has been rising. This year, the firm sought a solution to improve its production efficiency and prevent the incidence of errors.

In fact, the company's goal was to upgrade its manufacturing line to meet Industry 4.0 standards, with machines augmented with sensors and wireless connectivity. That meant automating the collection of data about each item's production in real time as that item moved through assembly. Management wanted to know the status of not only each product, but also every worker station, and thereby identify bottlenecks.

Furthermore, the firm sought a system that would bring visibility to the inventory levels at its warehouse, so that it could respond quickly to replenishment needs. Finally, by tracking the shipping of goods, managers wanted to ensure that every shipment was accurately packed for a given customer's

order. The RFID technology has helped to resolve those issues, a spokesperson for the company reports.

Early this year, Chen says, EPC Solutions helped the company to embed passive UHF RFID tags directly into each product. The tags are thus invisible and can remain with a product even after it is sold, though the tags are not read after an item leaves the facility. To read those tags onsite, the firm installed Alien Technology ALR-9900+ overhead fixed readers, along with four ceiling antennas above the gate where goods enter and leave the facility's warehouse. The company also installed a Zebra Technologies HLR-E300 fixed reader with a customized patch antenna at each workstation, in order to detect products arriving at and then leaving that station.

In addition, EPC Solutions built an RFID reading cabinet that captures high-volume reads of goods as they are loaded onto carts. The company's software is integrated with its own management software, and data resides on a dedicated local server. With the new technology in place, every employee is provided with an RFID-enabled ID card. The card's RFID tag enables the system to know where an individual is working, or where he or she was most recently located when within range of an RFID reader.

As each new product is manufactured, a UHF RFID tag is built in between the layers of foam comprising that product. The unique ID number on its tag is linked to data about the item being built, as well as the customer order it fulfills, in EPC Solutions' software residing on the company's own server.

The product next moves through the cutting, printing, lamination and packing stations. At each location, the reader captures the tag's unique ID as it arrives at the work station, then transmits that data via a cabled connection to the software, thereby updating the product's assembly status. The tag ID is linked to the time at which it was located at

that station, as well as the ID number of the employee working on that product. When the item leaves that workstation, the reader no longer reads its tag ID and the software thus updates its status to indicate that the process is complete.

The software calculates the length of time that the item spent at each location. If the software determines the product has dwelled at a specific station for too long, an alert can be issued to management to indicate a potential slowdown in production. Managers can then contact the specific worker whose badge ID was captured from that workstation.

Additionally, some products require different workstation equipment settings, based on the purpose for which they are built. For instance, a paddleboard may require cutting for a specific size. When the system identifies the product, it links that ID to the type of product, and that information is then displayed for workstation employees so they can adjust the equipment settings to match the requirements for that particular product.

Finished products are stacked on carts as they are prepared for shipment to a customer. The carts are also equipped with an RFID tag so that the cart can be uniquely identified. In that way, the cart's ID number can be married to the tag ID of each product loaded onto it. The company must then identify which goods are on that cart as it is loaded into a delivery vehicle. "After the packing process, they use a cart to pile up the goods," Chen says, "and then the cart passes through an isolation area to scan the goods' tag and cart's tag."

EPC Solutions custom-built the isolation area to ensure that every tag stacked on the cart would be read, and that no stray reads would be captured from other products within the warehouse. The collected data is forwarded to the software to indicate what is packed in a specific order. The software compares the data against the customer's order and displays an

alert if it finds that any errors have been made.

In the event that an error is detected, employees use an Atid AT-880 handheld reader to interrogate the tag ID of each product, in order to locate the one that is incorrect or to pinpoint any missing products that have not been detected with the load. The same handheld reader is used for quality assurance, and to locate specific products within the warehouse.

Since the system was taken live, Chen reports, it has prevented both production and shipping errors, while also helping the company to identify bottlenecks and work slowdowns—and, as a result, to address problems and retrain workers when necessary, in order to speed up production. The RFID reader at the warehouse updates inventory levels as materials arrive and as the boards are taken to the assembly floor. What's more, alerts can be sent to management to warn them of a replenishment requirement, thereby ensuring that materials are never out of stock and that assembly is thus never delayed.



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