

RFID Helps Endwave Track Work-in-Progress

The company is utilizing EPC Gen 2 tags to monitor the production of communications hardware for the aerospace and defense sectors.

By Claire Swedberg

June 26, 2008—Endwave Defense Systems, a manufacturer of amplifiers, transceivers and other RF communications modules for the aerospace and defense industries, is employing RFID technology to gain visibility on its production floor, and to monitor the status of work-in-progress at its 20,000-square-foot facility in Diamond Springs, Calif.

By tracking each bin of components from the time a module is ordered through the final inspection of that product before its shipment, Endwave can know where a specific order is located, how long it has spent in any particular place and who has worked on it. The company can also receive alerts if an unauthorized employee works on a product, if a product is sent back to a previous work station (or "cell") to be reworked, or if it is delayed at a certain point during production. The firm piloted the system at the end of 2007, deploying it in the production facility in February 2008.

When Endwave receives an order, product floor employees take a plastic bin (bins vary in size from about half that of a shoe box to the equivalent of three shoe boxes) and fill it with all of the components necessary for the product's assembly. The bin passes through up to five separate assembly cells, then waits on a shelf until a worker takes it and begins working on the product. The employee then returns the pieces to the bin and passes it on to the next cell.

Once the product completes assembly, it goes through quality assurance—including final visual inspection and physical tests—before being shipped to the customer. But with hundreds of products being manufactured at any given time in the large facility, if a customer calls for an update on a particular order, an employee must walk through the assembly floor to physically search for the corresponding bin.

The RFID-based tracking system, designed by Omnitrol Networks, makes that process easier, according to David Orain, the firm's VP of marketing. Omnitrol installed 12 Motorola XR400 readers on Endwave's shelves, and at other locations where the bins are stored as they move through production.

Endwave applied Alien Technology Squiggle EPC Gen 2 UHF RFID tags to the bins that pass through production, as well as on each employee's ID badge. When the company requires a new staff badge, it can input a worker's name into an Internet-based server hosted by Omnitrol. Omnitrol software then instructs a Zebra Technologies RFID printer-encoder, located on Endwave's site, to create a badge by encoding its RFID tag and printing the unique ID number linked to the employee.

When a customer calls in an order, a staff member enters an order number and the requested product type into the Omnitrol server, linking that data with a bin number. The employee then takes an empty bin, fills it with the necessary components for that particular product and scans the bin's RFID tag, linking the order to that RFID number. As the bin passes to a production cell, it is placed on a shelf. The Motorola reader captures the

bin's ID number within about 2 feet, then transmits the ID number—along with the time and date—to an Omnitrol application network appliance, which collects data from all of the readers and makes it available in a dashboard format, either on a video monitor attached to the appliance or on Endwave's computers.

The appliance can also send an alert via e-mail to Endwave management if a bin sits for too long on a particular shelf, or if it is taken from a shelf without being returned. What's more, the interrogators capture the unique ID number of each employee badge. That ID number, linked to a specific employee, is stored by the Omnitrol appliance, enabling management to view the history of any order—not only when and for how long it remained at a particular location, but also who had it and how quickly a specific process was completed.

If an employee unauthorized to work on a particular order takes a bin from the shelf, the readers transmit an e-mail alert. Similarly, if there is a problem with an order and it must be sent back to a previous cell for reworking, management can receive an update indicating the product's location.

RELATED_ARTICLES Endwave expects to see cost reductions comparable to at least one full-time employee, Orain says. Another benefit, he adds, comes from increased customer satisfaction due to faster response times to requests for order status reports. Endwave currently prints daily reports regarding work done on the assembly floor, which provide such analytics as revenue associated with a specific order. Previously, the company created such reports only about once weekly.

According to Orain, the complete solution, including software, RFID readers, printers, installation and training, cost less than \$100,000.

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