



SPEDE Technologies, interviewed by Next Generation Manufacturing, July 2007

## **Wireless Technologies Yield New Efficiencies on Factory Floor**

*Next Generation Manufacturing Magazine asked Bob Bunsey, President and CEO of SPEDE Technologies, to describe how the latest wireless technologies are being used to increase efficiency and accuracy in plant floor operations.*

**NGM:** Let's look at RFID first. Is RFID more efficient than barcode scanning?

**BB:** Speed, accuracy and efficiency are three potential benefits of RFID over barcode scanning. The ability of RFID to read multiple tags instantly can save a lot of time over manually scanning every barcode label on a pallet. Plus, an RFID portal or forklift reader can read tags automatically as the material keeps moving, which is a very efficient way to capture information in real-time, without stopping the flow of material to scan barcodes. RFID readers don't require line-of-sight, which makes it possible to read tags on inventory items that can't be accessed with manual scanners. On the other hand, scanning barcodes can be labor-intensive. It does require line-of-sight, and it can read only one barcode at a time. It also comes with a potential for error if the worker forgets or neglects to scan.

But RFID has limitations too. For instance, if you want to use RFID tags on racks and bins, the nearness of the tags to each other may give a false location. Barcoding doesn't have this problem because you look at the item you want, and scan it.



**NGM: How can a company know if RFID would deliver the ROI to make it worthwhile?**

**BB:** Whether a company should implement RFID depends on the business problem they're trying to solve. The best way to find out if there's value in RFID is to try it on a limited scale, by doing a pilot project. This will let you test the technology in your environment, without investing a lot of time and money. For example, we can do an RFID proof of concept for as little as \$5,000. Choose an operation where scanning is a problem in terms of accuracy, labor, or delays in material flow. Trailer loading is a good starting point if you have shipping errors, and especially if you're already RFID-tagging your customer shipments.

**NGM: What things can you learn from an RFID Pilot Project?**

**BB:** All the issues you need to consider in a full scale deployment have to be addressed in a pilot. This includes tag creation, radio frequency, application of tags to the material, type of readers, forklift speeds, read ranges, read rates, changes to existing processes, data management, etc. But once these issues are resolved and you're getting 100% read rates in a live environment, you can decide whether it makes financial sense to expand RFID further. The question is, did RFID solve the business problem to your satisfaction, by delivering the metrics you needed? If not, there may be other wireless solutions that will work better. But without this hands-on experience, it would be difficult to know the value that RFID would offer your company.



**NGM: Is it necessary to achieve 100% read rates for an RFID project to succeed?**

**BB:** If you're implementing RFID to achieve 100% accurate shipments, then you have to read 100% of the tags being loaded on a trailer, so you can be sure that what is being loaded is what should be loaded, and nothing is left behind. If you are reading RFID tags at the pallet level only, you should be able to get 100%. But if you are reading tags at the case level, things could get tricky.

If the best average you can get is less than 100%, then you have to ask - what is the potential cost or ramification to our company if some percent of outgoing product is not being recorded or checked for accuracy? Which items were not recorded? How will this affect inventory, customer satisfaction, and product traceability? If you can't get 100%, you might consider using RFID pallet labels and associating them to the case labels at pallet-build time, and then reading only the pallet tags via RFID. Or, you might just improve on your barcode scanning process, and forget RFID. By the way, you'd still want to use barcode scanning as a backup to RFID, in case some of the RFID tags are unreadable.

**NGM: Is it possible to get the RFID technology right, but still have shipping errors?**

**BB:** Yes. Technology is only part of the solution. Building accuracy into material handling operations is really about managing human behavior. Whether they're receiving, labeling, picking, or counting items, technology is just a tool that makes it possible for workers to get information and respond to events in real-time. To achieve 100% accuracy, you must have well-designed



processes, combined with software controls to automatically enforce them. A well-designed process will anticipate the actions an operator can take at a given point, and then limit their options, or verify that the action they are taking is correct. In our solutions, we use serial numbers as the mechanism for controlling material handling processes and inventory events, in order to prevent errors.

### **NGM: How can using serial numbers prevent material handling errors?**

**BB:** A serial number is a way of uniquely identifying a unit of material. Associated with the serial number is a lot of detailed information about the item, including part number, quantity, hold status, etc. Scanning the serial number enables our software to instantly validate that the transaction being recorded for this inventory item is correct. Serial numbers can prevent a transaction from being recorded twice, or not at all. And they are invaluable when tracing quality issues to their source, and tracking specific shipments that need to be recalled.

Serial numbers are especially critical in preventing errors in picking and shipping. When a pallet's serial number is scanned during picking, our software verifies that the part and quantity are correct, and FIFO rules are followed. If there's an error, the material handler is alerted. The picked serial numbers are then allocated to that order number, so if the order is staged, it can't be raided to fill other customer orders. At shipping, all of the serial numbers for the order must be loaded on the right trailer, or the software won't send the ASN and ship transaction data.



So achieving 100% accuracy is a combination of good business processes, real-time software control, and the right technology. If any of these components is missing, you will probably still have errors.

**NGM: What do you tell a supplier that has to comply with customer mandates for RFID-tagging or labeling shipments? Is there gain, or just pain?**

**BB:** Our philosophy is that if you are investing capital and labor to put labels on customer shipments, use your investment to increase efficiency, reduce labor costs, and eliminate the errors that cut into profitability. It's your inventory - and your financial liability - until it ships, no matter whose label is on it.

With a wireless infrastructure, you can scan or RFID-read the customer labels from the moment they're applied, and track the inventory in real-time, control your warehousing and shipping operations, and get serialized traceability. You can also dramatically reduce physical and cycle count labor by scanning instead of counting. Usually the system will pay for itself in less than a year, in terms of reductions in labor costs and expedited shipping fees, inventory optimization, and increases in productivity.

So don't just slap and ship - use the mandate to your advantage. If you view mandates as a chore and just do the bare minimum to comply, you'll miss inherent opportunities for process improvement that can directly increase your profitability.

**NGM: Are there advantages to using wireless technology, as opposed to hardwired, in a manufacturing plant?**



**BB:** Yes. Keep in mind that material handlers are constantly moving, and the goal is to keep them moving efficiently. In a wireless environment, information travels with the worker via their RF or RFID device. In a hardwired environment, the worker travels to the information -- such as a PC on the plant floor. Often they take the material with them when they need to look up something or print labels, which wastes time and disrupts the efficient flow of material. A wireless solution gives the worker the information and label-printing tools they need at the point of the event.

Plus, things can change on the plant floor. Production lines may need to be moved. Wireless gives you a lot more flexibility, and more options for system expansion. It's much faster and cheaper to relocate wireless devices than it is hardwired terminals, PCs and printers.

**NGM: How are you integrating wireless devices on the plant floor?**

**BB:** There's virtually no limit to the ways you can use wireless technology to streamline processes, once you have the RF infrastructure in place.

For example, in a given installation, we might use RF handhelds for inventory transactions, look-ups, and labeling; and wireless touchscreens at the production lines instead of PCs. We connect weigh-count scales and PLCs to the RF network to record production and track WIP real-time, and use barcode or RFID Kanban cards to automatically record raw material consumption and trigger replenishment. We also connect label printers to the wireless network, and mount them to carts that can be moved to the inventory, instead of moving the inventory to a printer. We use RFID portals at shipping/receiving docks,



and can add forklift RFID readers if a client wants true mobility when recording warehousing and shipping transactions.

All of these RFID, RF and plant floor devices are connected to a WI-FI network, which is controlled by our software on a Windows Server. Everything runs concurrently and with sub-second response times. Because our software can support virtually any device connected to the RF network, we can automate operations throughout the plant floor.

**NGM: What are some of the more challenging material handling issues that you have solved?**

**BB: Eliminating errors in labeling finished parts –**

Many of our customers are automotive suppliers, and they absolutely must label their finished parts with 100% accuracy. If right-hand labels go on left-hand parts, pack counts are wrong, or labels are outdated, it can shut down the OEM's production line. So we developed two patented solutions to error-proof the container labeling process.

Push-Button Labeling, and RFID Badge-Activated Labeling, are wireless solutions that completely change the traditional labeling process. First, they enable you to print container labels right at the production line as the parts are made and packed into containers - a concept Honda calls Line-side Labeling. By printing the labels at line-side, you eliminate the errors that happen when labels are batch-printed and distributed later.

Second, there's no need for machine operators to use PCs. Instead, whenever they need a label, the operator just pushes a wireless button, or passes their RFID badge in front of an RFID reader in their work cell. This action sends an RF signal to the application server, which knows the part



number or production machine associated with that push-button or RFID reader, and automatically sends the correct label data to the printer in that work cell. The operator doesn't have to leave the line, walk to a PC, use any software, or wait for a printer. They can stay at the machine and focus on making, packing and labeling parts.

Third, if a machine is producing multiple part numbers simultaneously, and various different labels are needed, we use a wireless touchscreen instead of the button or RFID reader. The touchscreen displays colored icons that represent each part number being made. The operator just touches the appropriate icon to print the label they want.

#### **BB: Tracking steel coils --**

Another challenge was tracking the locations of huge steel coils, to facilitate picking and inventory control. We used a laser distance meter connected to the RF network, to plot a coil's precise location and send this data to the overhead crane operator's RF screen.

It's exciting how creatively technology can be used to improve processes. We love the challenges, and our customers are happy too.