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Powershelf Adopts RFID With One-Penny Tag

The smart-shelf technology, from Compass Marketing, now features RFID readers built into the shelf labels and low-cost tags, proprietary to the system, with about a 3-foot read range.

By Claire Swedberg

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Mar 15, 2018—Compass Marketing says it has developed a one-cent ultrahigh-frequency (UHF) RFID tag for its Powershelf brand that will work with its smart-shelf solutions to track products stocked on RFID-reader equipped shelves. The low-cost tag release is timed in conjunction with a UHF RFID technology functionality that the company is offering with its smart-shelf solution. The new tag has a shorter read range than traditional EPC UHF tags, says John White, Compass Marketing's CEO, and is designed for the smart-shelf application. In fact, the low-cost tag is designed for use only with Powershelf's proprietary software.

Compass, an Annapolis, Md., consumer goods marketing company, has accomplished the low-cost RFID tag, in part, by using less silicon than is built into traditional tags, White says, which means it also has a maximum read range of about 3 feet. That, he notes, is sufficient to determine whether a tagged product has been removed from an RFID-reading shelf. The tag is being made by a third-party vendor according to Powershelf's specifications. The Powershelf's built-in reader includes a UCODE G2 IC reader chip from NXP Semiconductors built into the electronic price label on the shelf.

The Powershelf technology was designed to enable stores to electronically update prices on small LCD screens mounted on product shelves. With a weight sensor, the system could detect if a shelf were empty, and forward an alert to store personnel or management indicating that status.

In 2015, the company added Bluetooth Low Energy (BLE) beacons made by Panasonic to the solution—which was known as the Intelligent Retail Shelving Solution—so that retailers could connect their customers with location-based content via a mobile app (see Panasonic Adds Bluetooth Beacons to Electronic Shelf Labels). The BLE system, including the BLE beacons, can be attached to the rails on which the smart-shelf labels are mounted.

The new low-cost UHF RFID tag is timed in conjunction with RFID technology rollouts among Powershelf customers, both brands and retailers. Supermarket chain Giant Eagle. The company is using the PowerShelf technology, with Qualcomm 3G networking, at some of its 299 stores, and will be incorporating RFID into some of that technology in recent months.

Food brand King's Hawaiian was among the first customers of the Powershelf solution, which traditionally consists of sensors on shelves to detect the weight of products on their surface, as well as a wireless connection to send that data to a server. Now, the company plans to trial RFID technology as well. In so doing, the brand hopes to learn how the system enables the company to identify specifically which item has been removed from or placed onto a shelf, based on tag reads—thereby providing more specific and accurate on-shelf information.

Without technology-based solutions, the company explains, knowing what products are on the shelf is a challenge for any retailer, but perhaps more so for grocery stores. Products sell quickly based on the flow of customers, the time of day and other factors. Out-of-stocks can be difficult to detect among the large number of products. In fact, professional services firm Ernst & Young says 8 percent of products in such stores are typically out of stock at any given time.

Of that 8 percent, says Anand Raghuraman, who leads Ernst & Young's consumer products and retail strategy practice, half choose to buy a different brand. The other half, meanwhile, simply do not purchase the product and presumably go to another store.

For brands like King's Hawaiian, which makes sweet rolls and other Hawaiian-based food items, "The key issue is understanding out-of-stocks," says John Linehan, King Hawaiian's president and chief strategy and planning officer. "We know we have a lot of them, but Powershelf gives us data around how often, how long and when." With a better understanding of the circumstances around each out-of-stock event, the company and the retailers selling its products can better resolve those issues.

With RFID, however, the smart-shelf system can collect the data even more precisely. "This could be a very significant technological advance for the industry," Linehan states.

Historically, the placement of RFID tags on products such as groceries has been unfeasible due to tag cost. Tags priced between 5 and 10 cents apiece simply are too expensive when it comes to placing them on products valued only at a few dollars, White says. In addition, the installation of fixed RFID readers on ceilings or at portals can be costly. Using handheld readers for periodic stock checking is often labor-intensive, he adds, and does not provide real-time data.

However, White says, when the price of tags drops to a cent, that same application becomes much more affordable. Additionally, with the reader built into the shelving, the installation provides multiple features, including electronic price labels, beacon-based data for consumers, and the inventory counts.

The software provides a dashboard which store management onsite, or at a remote location, can view in order to understand stock shelf status in real time. With such data, companies can drill down to how quickly certain products are selling, as well as how quickly they are being replenished on shelves.

For instance, explains Julia Flood, Compass Marketing's project manager, a retailer or brand can view how well the products are selling, when they go out of stock, and the cost in lost sales related to that out-of-stock incident. The software compares the average sales rate of the product, the value of each sale of that product, and the amount of time it is missing from the shelf, thereby creating a dollar-based loss in revenue. "A lot of algorithms go into the process," she says.

The software can also be set to alert store personnel or managers, either immediately when a shelf is out of stock, or every few hours when shelves are not replenished. This information can be more specific, however, with the use of RFID to detect exactly how many products are on the shelf, as well as how often each one is removed from the shelf and then returned (by browsing customers, for example).

Ernst & Young measured the effectiveness of the Powershelf data prior to implementing RFID into its system. The analyst firm measured the impact of Powershelf at Giant Eagle across 200 brands and found that the technology reduced the rate of out-of-stocks. "Inventory is one part of a larger picture around customer experience," Raghuraman says. "If you [as a consumer] go to a store and they don't have the products you're looking for, you'll go somewhere else. That's a central part of the customer experience."

While Raghuraman says there is no one-size-fits-all technology solution for retailers and brands to prevent out-of-stocks, he sees RFID as a good solution for stores with a fast product turnaround. "When you have a high SKU-count environment with lots of rotation, or where products are small or can be misplaced," he states, RFID can be a good solution.

The Powershelf technology is also of interest to other industries beyond retail, White reports. For instance, hotels could use the shelves for visibility into products they have on their shelves, such as towels, linens or items they provide or sell to guests—toothbrushes or razors, for instance.

"Its always hard to forecast technology but we do see [Powershelf and RFID] as a long-term solution for out-of-stock issues," Linehan states. "They can help us experiment with a variety of solutions and actually see, in real time, which ones are working and which ones are not."