Maniva Achieves Automated Control of Seltzer Kegs with RFID

By Claire Swedberg

Passive UHF technology from RFID Global by Softwork allows the company to automatically track when its 10,000 steel kegs are filled and sent to customers.

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Maniva Corporate Group has gained automated visibility into the reusable assets that transport its seltzer water to restaurants and bars, and then return to the company's facility empty, thanks to radio frequency identification (RFID) technology. The solution is provided by Italian technology company RFID Global by Softwork, including on-metal tags, a FEIG Electronics reader on the filling line, and BST Nexus software that manages the collected data on the company's server.

Launched in 1998, the Italian mineral water and beverage company sells its products to consumers via large-scale retailers. By tracking the metal kegs via passive ultrahigh-frequency (UHF) RFID, Maniva has been able to capture where the canisters are located, and thus their status, as they are sanitized and filled. In that way, the company ensures that it does not lose track of these high-value items, and that they are being used in the most efficient manner.

Maniva operates out of Bagolino, in the province of Brescia in North Italy. That location is key, the company notes, as the bottling site is in a mountainous region in which a water spring on Mount Maniva was discovered in 1860. The company accesses this water to produce five beverage brands, selling 170 million bottles of water annually around the world. One of its recent products is Good Water, the official water served at the U.N. Framework Convention on Climate Change, held last year in Egypt.

Deploying 10,000 Metal Containers with RFID

To transport its product to restaurants, Maniva uses 20-liter (5.3-gallon) canisters or kegs. The company's Acqua Minerale Alpina Mineral Seltz brand of seltzer water, used by restaurants and bars to make mixed drinks and cocktails, is contained in a steel keg that is transported on pallets to the restaurants and is then returned empty. The seltzer product was launched two years ago, and the company has been using a manual process to track the kegs as they are received, sanitized, refilled and shipped.

Michele Pelizzari

Maniva uses approximately 10,000 steel canisters. Compared to plastic canisters, the company reports, these can better preserve the water's carbonation. However, the metal kegs are expensive, and Maniva sought to automate the process of tracking each one as it is filled with seltzer, according to Michele Pelizzari, the

company's production manager. Maniva had no experience with RFID technology when it began working with RFID Global, but it had a vision of gaining an automated view into when each container was filled so that it could identify anomalies, such as a container not being returned from a customer site, or the proper sanitation and filling process not being carried out.

The goal, according to Pelizzari, was to ensure not only that the containers were not lost, but also that they were processed properly for each customer order. Maniva worked with RFID Global to conduct onsite tests and a feasibility study between November and December 2021. After considerable testing to ensure a 100 percent read accuracy, the RFID system was taken live last July, says Paola Visentin, RFID Global's media director. The system needed to track when the washing and filling process was provided for each keg, as well as ensure its return to the plant once it was emptied of the seltzer water.

The solution consists of Softwork Group's Global Tag on-metal, ruggedized UHF RFID tags riveted to each keg. To launch the system, Maniva's onsite personnel riveted tags to each of the 10,000 metal canisters, recalls Alberto Abrami, an RFID technical specialist at RFID Global by Softwork. The tag is attached to the metal handle on the top of the keg, to ensure proper RF interrogation and transmission. This also provides protection from damage in the challenging environment in which the kegs are knocked around and exposed to high-pressure cleaning and high temperatures.

Reading Tags on the Production Line

RFID Global by Softwork deployed a single FEIG LRU 1002 long-range RFID reader, along with two antennas above the conveyor. Two additional antennas are mounted above the production line, one on each side. The system also includes an optical sensor to identify kegs as they arrive along the conveyor and move toward the filling area.

Paola Visentin

During production, each keg is washed, sanitized and filled with seltzer water. Once this cycle has been properly completed, the kegs pass the optical sensor, separated by about 50 to 60 centimeters on the production line. When the optical sensor identifies a keg's presence, the reader awakens and captures the unique ID number encoded on its tag. That ID is linked to the keg's identity in the software. As the keg is read, the company's manufacturing execution systems software can thus record each washing and filling phase, using data from the RFID software.

When the process is completed, the software updates the status with a timestamp. In this way, the company can not only gain a real-time view into the kegs' status, but also monitor each canister's full lifecycle. This data, such as how often a particular keg has been filled and reused, can enable analytics, as well as quality assurance. The filled keg is then shipped to the restaurant and is later returned empty. At that point, the keg is unloaded from the van and prepared for the next cleaning and filling process, at which time the tag is again read and linked to a new order.

Overcoming a Metallic, High-Density Environment

The greatest challenge related to this application, Abrami says, was to ensure accurate RFID tag reads without stray reads from neighboring kegs. The facility's high level of metal and tight spaces can pose problems for standard RFID systems. "The container is made of steel and rubber," Pelizzari adds, "and detection with antennas was difficult." After early testing was conducted, the team found considerable disruption to UHF RFID reads. There were false positives during early testing, along with stray reads from nearby kegs that were not actually on the conveyor.

Alberto Abrami

RFID Global by Softwork addressed this problem by identifying the best position for the antennas on the processing line, and by compromising between the power of the radio signal emitted by the antenna and the setting of the RSSI filters. Thus, Abrami says, the reader software was able to filter out tag reads outside the immediate area. The company opted to include a light-emitting optocoupler on the conveyor line, in front of the RFID reader, so that the device would not send interrogation signals until there was a relevant keg within range. Now, he reports, 100 percent of tags are detected properly.

The system became fully operational in July 2022. "After a few months," Pelizzari says, "we could cross-reference the tag data with the production lots for quality reporting," thereby ensuring that the number of kegs being filled met customer orders. Down the line, the company plans to expand the technology's use to automatically identify a canister that may be defective or require maintenance, he adds, and to trigger an audible alert and light so an operator can remove it from the line.

While the solution provides information about the processing of kegs, it does not yet allow Maniva to know when the kegs are returned empty from customer sites. That, however, is the next stage of the installation project, and Abrami says a reader at the receiving dock is now being tested. The return on investment has been based on the ability to monitor its fleet of kegs, and to identify if any might be missing, or if anomalies occur. In the future, another expansion may involve an additional reader at the beginning of Maniva's production line, which would intercept any unsuitable kegs or those requiring maintenance.

Key Takeaways:

- Maniva is tracking the filling process for its steel kegs of seltzer before they are provided to customers.
- The system enables the company to automate data collection regarding when each keg is cleaned, filled and shipped to a customer, while expanded versions of the solution are now being tested.