RFID and BLE Propel Equipment Visibility for Helicopters

Rapid-response organization Life Link III knows exactly where its life-saving equipment is as it dispatches its eight helicopters around Minnesota and Wisconsin to rescue or transport critically ill patients. That data is captured via readers using a variety of active and passive RFID tags and Bluetooth Low Energy (BLE), and it is managed on cloud-based software as part of a solution from Operative IQ.

EMS Technology Solutions has been providing the Operative IQ management software since 2007. During the past year, Operative IQ has added several flexible options to include fixed RFID readers with customizable coverage and a handheld version of its UHF RFID-based system to make it easier and lower in cost for agencies to deploy.

Lisa Rainey

The Life Link III air medical transport group is among the 46 EMS providers that have adopted the solution, says Lisa Rainey, Operative IQ’s business-development director. Life Link III says the solution has boosted the accountability of equipment as it is stored, loaded into vehicles and used in emergency responses, leveraging data from both RFID and BLE tags attached to its equipment.

Life Link III, a medical flight and emergency services group,
transports critically ill patients by helicopter to or between hospitals. Its helicopters operate throughout Minnesota and Wisconsin, and each aircraft carries equipment used to stabilize and transport patients. The agency also stores some of this equipment at the bases it operates. “Our operation is made of eight base locations, six in Minnesota and two in Wisconsin,” says Eric Anderson, Life Link III’s logistics manager.

The consortium sought a way to better track its equipment, Anderson explains, as well as reduce losses, the need for redundancy and labor hours workers spent manually counting items at each site. “With all the equipment we have and how much it moves around,” he says, “swapping out equipment from the PM [preventative maintenance department] and putting spare equipment in made it hard to maintain accountability of all the of the equipment.” In fact, managing an accurate stock count required considerable manual efforts from those in the field. “We would have to constantly check in with each location to see what serial number of each piece of equipment they have on hand.”

In 2019, Life Link III undertook a month-long pilot of Operative IQ’s solution, then deployed the technology to identify what equipment was in storage, where it was located and what was on the helicopters at all of its sites. The solution consists of fixed readers at each base that read RFID and BLE tags on goods, as well as cloud-based software to manage data related to where each tag was read and the status of every tagged item.

To deploy the system, Life Link III worked with Operative IQ to select the right UHF RFID tag to apply to each of its items. Most of the equipment being tracked required a small RFID tag, though users still needed the tags to have a read range long enough that they could be easily read in a storage room or aboard a helicopter. To ensure that all of the tags
could be captured easily, the company opted to deploy a combination of passive UHF RFID and BLE tags that could be interrogated via the reader’s Bluetooth functionality.

Operative IQ was founded 12 years ago to provide an emergency services responder in Georgia with a software solution for EMS management. “Our product offering is focused on first-responders,” Rainey says, including police, fire and ambulance rescue; however, the solution has expanded to healthcare, veterinary clinics and educational programs. For any of these parties, the solution provides operations management by capturing data regarding the location and status of goods, whether those items are in a storage room or loaded onto an emergency vehicle. The software also tracks medications and controlled substances that may be carried in vehicles and must be secured.

The company’s first solution, known as IQ Genius, consisted of a fixed reader, data processor, antennas and indicator lights mounted inside, and powered by a vehicle. Goods were tagged and loaded onto the vehicle, and when tagged items were removed, the Operative IQ software captured that event and could provide alerts, analytics and reports indicating what was removed and when. “If you have a fixed reader in the vehicle or facility,” Rainey explains, “it posts [in the
the first time a tag was read and the last time it was read, with GPS information.” In that way, she says, an agency’s crew can receive alerts if an item is left on the scene, and management can view the history or an item’s use and movement.

Some agencies, however, required a lower-cost solution, as well as greater flexibility to deploy according to the needs of a specific vehicle, station or agency. Therefore, Rainey says, Operative IQ improved its handheld version of the solution last year to read both assets and consumables. “The main crux is to automate tasks individuals already conduct to track inventory.” The RFID system is designed to work with a standard inventory-counting process, but to capture data automatically.

An agency, such as Life Link III, would first apply RFID or other automatic-identification tags to products before they are placed in storage or loaded onto vehicles. Fixed RFID readers would capture continual live data, or workers could use a handheld reader to interrogate each tag and input the product’s serial number and other information, such as its expiration date, to update the location and status of items in the Operative IQ software.

The handheld readers can be used for regular inventory counts, to verify that expected assets are present, or to alert when equipment is moved or missing. For instance, as goods are taken out of storage and placed onto a vehicle or aircraft (a helicopter, for instance), or as they are moved from one vehicle to another, the tags are typically read via the fixed reader. A user can log into the IQ Mobile app from the reader to link read data to a particular vehicle or storage room, then follow prompts updating the status of items and view information such as the pending expiration of a given item, or an indication that a specific product may be misplaced or missing from a vehicle.
Operative IQ offers agencies the flexibility to tag and count items in various packaging, Rainey says. Tags are custom-printed to account for available stock with what it calls the ability to “mix and match” tags to identify cases, boxes and individual quantities of items within boxes or other containers. The handheld reader’s flexibility has been driving sales from EMS and fire departments, Rainey reports (where inventory counts in outlying stations and supply rooms can be reconciled periodically), while in some cases fixed readers can be used for live updates and changes in specific areas or vehicles.

The company also provides tags for assets or consumables, though users would typically perform the physical tagging. In some scenarios, agencies may purchase an “assisted implementation” package, in which case Operative IQ would work with the agency to build out processes, determine the tagging strategy, and provide onsite training. With fixed readers, the solution can provide alerting based on preset parameters, the company notes. For instance, if a fixed reader antenna were deployed, an agency’s management could receive an update indicating a controlled substance or other product had left storage or a vehicle as soon as that item was removed from a secured site.

In addition, Operative IQ has added functionality to the system this year related to automating maintenance tracking. For example, Rainey says, the software can update maintenance records about air tanks filled with compressed air at fire department fill stations using RFID. What’s more, inspectors or maintenance personnel can update data related to the work they carry out on a specific item. The system can also provide weapons management for police departments. The goods being tracked can range from weapons, tasers, ballistics protection, speed detection and other highly secure devices for law enforcement to firefighting and rescue equipment.
Since deploying the system a year ago, Life Link III says it has found that the technology has boosted its efficiency. “It is definitely a time saver,” Anderson states. “I can verify very easily where our equipment is located and that it is all accounted for.” In the future, he says, the organization may evolve the technology’s use to include GDP tracking.

According to Rainey, other agencies using the system have told Operative IQ that the solution has improved inventory accuracy while reducing the amount of time their employees spend manually counting inventory. One fire-rescue customer using the system, Florida’s North Port Fire Rescue, has reported that it previously required half a day to count inventory in its vehicles or storage rooms manually, but that it can now accomplish the same process within only a few minutes.