

The automaker is using Ubisense RFID tags to track the locations of vehicles as they move through the final steps in the company's manufacturing process, as well as to obtain business analytics regarding the time spent at each stage.

By Claire Swedberg

Oct. 12, 2009—High-performance car manufacturer [Aston Martin](#) is employing RFID to track the movements of its custom-made vehicles as they pass through the finishing process to ensure they are produced according to the demands of the automaker's customers.

Nick Lines, the firm's general manager of manufacturing engineering, says that the system, supplied by real-time location (RTLS) technology company [Ubisense](#), informs Aston Martin of the whereabouts of cars during the "off-tracks" (finishing) process, how long each process takes to complete, and where bottlenecks occur. The automaker installed the RTLS at its production facility in Gaydon, Warwickshire, in early 2009.

Aston Martin assembles only 7,000 cars annually for a high-end market, with approximately 200 man-hours spent on each vehicle as it is put through rigorous testing before being made available to a customer. Every car is taken on a road test to evaluate and "bed in" the brakes, remove the silicone from the tires and appraise the vehicle's general performance. The car also undergoes a "monsoon test," in which 4,200 liters of water are sprayed onto the body to make sure it is watertight. (The water is then recycled.) Finally, the car is moved onto the "Customer Audit Line," where workers visually appraise the vehicle.

"It isn't until all these processes are complete and we are fully satisfied that the car is finished to the high-quality standards that we set, that we fit the iconic wings badge as a seal of approval," Lines says. During this testing, however, if a vehicle is found to have any problems, it is moved off the testing line and either sent outdoors to temporary buildings (where it is reworked), or stored within the facility itself for a short period of time until the issues can be rectified.

Having visibility of cars removed from the line had been nearly impossible without manually checking for them within the facility, says Richard Green, Ubisense's CEO. The company wanted a better system that would enable it to know where all of its vehicles were in real time, and to understand the dwell time at each step, as well as which model numbers took more or less time at any particular station. "We were looking for an intelligent solution to allow us to monitor cars through our off-tracks processes," Lines explains.

Today, Aston Martin's staff attaches a Ubisense battery-powered 6-8 GHz ultra-wideband (UWB) RFID tag to the inside of each vehicle's windshield once the cars have been assembled and are headed for the offline processes. The company installed approximately 44 Ubisense readers—known as Ubisensors—within the facility at the finishing area, as well as outside where vehicles were stored.

Each tag sends its unique ID number by emitting a series of short signals (as short as billionths of a second) to the readers; those signals are emitted at a variable rate, depending on whether the tag is moving or stationary. The readers then transmit the ID numbers to the back-end Web-based Ubisense server, where software calculates the tag's location within about 6 inches, by analyzing the strength of the RF signals, as well as the interrogators' locations.

The software also links each tag's ID number with data about each car, such as its vehicle identification number (VIN) and description. Each time the car passes from one place to another, Green says, its new location is sent via the readers, which can receive signals from tags as far away as 150 meters (492 feet) outdoors, and 60 to 80 meters (197 to 262 feet) indoors.

Aston Martin's employees can then go online to see where the vehicle is located. The Ubisense server provides a map of the facility, with an icon indicating each car's specific location. Users can also see a history of the processes a specific vehicle has undergone, and when, as well as which processes remain ahead. If the car deviates from an expected procedure—such as leaving the finishing line without completing every stage—an alert can be sent to designated Aston Martin personnel. Once the vehicle has completed the finishing process, its tag is removed for reuse on another car.

"It's working extremely well," Lines says, "especially for finding individual cars in the system and tracking the flow through the off-tracks processes." That has led to a time savings for Aston Martin's staff that would previously have been spent simply locating a missing vehicle. "Also, we are increasing the usage of the system to generate both business and performance metrics as awareness within Aston Martin of the system's capabilities improves." In this case, the company can track the time spent on particular procedures, and then make business decisions related to delays vehicles experience during specific processes.