



Case Study: RFID Enters a New Race



NASCAR – Car of Tomorrow

In NASCAR's pursuit of a common car for use in the NASCAR NEXTEL Cup Series, the design of the car addressed many safety concerns, as well as providing cost reduction and other benefits, such as enhanced camera locations. Since safety was a primary objective in designing the new car, NASCAR also was concerned about making sure the newer, safer components were used as designed and that all race teams remained in compliance with rules set forth by the sanctioning body. When looking for a method to certify parts and follow that certification with a quick, effective method of verification at the track, RFID was a logical choice.

Lakeland, FL-based Franwell, Inc. was selected to develop the certification and tracking system to be used on NASCAR's "Car of Tomorrow" (COT). Franwell is a leader in the area of RFID solutions and integration. Our products and services include a complete set of RFID integration services for a variety of diverse industries.

Project Objectives

NASCAR wanted a solution that could identify compliant parts for their "Car of Tomorrow". The system was to function as an information repository to record certain activity associated with a tagged part. The tracking process begins at NASCAR's Research and Development Center in North Carolina, where the part is initially certified. Once certified, the tagged part can be verified at key points at race events, such as, inspection, practice, pit road, and after the race.

NASCAR determined the initial implementation for tracking parts would include wings and chassis and that each part would need to be identified uniquely. In addition, NASCAR officials wanted to be able to use a handheld device at race events to lookup an item's relevant information and to cross-reference the manual certification form. Finally, the system had to be designed to allow for the inclusion of additional compliant parts such as; restrictor plates, fuel cells and shocks. An RFID solution was proposed and accepted which met NASCAR's project requirements.

Challenges to Overcome

Although Franwell had considerable RFID experience, working with the race industry had its own unique challenges. The items to be tagged were not RF friendly. The harsh environment made it apparent the tag itself would need to be protected from the environment. The Franwell team discussed several viable options with NASCAR before finalizing the technology requirements. Franwell recommended the tags and handheld readers that would work best with the compliance parts and the environment in which they needed to function.

Pre-Implementation Proof-of-Concept Testing

The project team that included Franwell, NASCAR, Sprint Nextel and Crawford & Crawford Composites, worked together to select the optimal combination of tags and readers. A considerable amount of time was spent looking into how the tags could be attached to the parts. During the initial testing, a tag was successfully embedded into a carbon-fiber wing. For the chassis, a tag was chosen that would be rendered unusable once removed and for added security, a hologram label is applied over the tags. The frequency selected had to work with the metal content of the chassis and the carbon-fiber in the wing.



To allow race officials to verify items during a race event, an application was developed to work on a handheld PDA running the Microsoft™ Windows™ Mobile 5 operating system. To enable RFID reading of the tags at the track, a compact flash RFID reader is used in the PDA. Due to low frequency's range limitations, the tags can be read from only a few inches; however, this still met NASCAR requirements.

Initial Implementation

NASCAR began certifying chassis at the end of 2006 and continues with this certification process as part of the COT program. This process involves the attachment of 10 unique tags to the chassis. These tags are placed at prescribed locations after the chassis has passed certification. The RFID tags are read and each tag is associated with that chassis as the final step of certification.



In order to ensure compliance, only certified wings are allowed to be used during a race. Therefore the wings are closely controlled and assigned at each race. Late last year, Crawford began embedding RFID tags in the wings for the COT. These embedded tags will be used to issue and collect the wings from the teams. Prior to a race, a wing is issued to each team and this assignment is tracked by scanning the RFID tag in the wing. When the wing is collected at the end of the race, the tag is again read, to indicate the wing has been returned.

Results and Future plans

Due to the success of the initial implementation, NASCAR is now expanding the program and is currently also tagging fuel cells. NASCAR expects to expand its use of RFID technology in many additional areas. NASCAR is scheduled to run the "Car of Tomorrow" in 16 races in 2007 and all 38 sanctioned NEXTEL Cup Series events in 2008. The certification system developed by Franwell will be in use at each of these races. The mobility represented by the use of the Sprint Treo, SD/RFID reader module and the Sprint nationwide EVDO network means that future implementations will allow the RFID data to be transmitted directly to NASCAR headquarters or anywhere in the world.

About Franwell, Inc.

Franwell, Inc. is a leader in RFID research and development, system implementation, and integration for diverse business operations. Our products and services include a complete set of RFID solutions for a variety of industries, such as apparel, retail foods, air cargo and pharmaceuticals, as well as an enterprise application for the fresh food wholesale industry. Franwell expertise comprises financial and business management, software engineering, and sales relating to production, logistics, and distribution. We have more than 25 years' experience in computer technologies, including software development, maintenance and implementation of ERP/WMS applications. Franwell has dedicated well over a decade to emerging RFID technologies. www.franwell.com steve.dean@franwell.com

About Crawford & Crawford Composites Inc.

Since 1990 Crawford Composites has become a major producer of structural laminates such as wings and chassis. The company has remained on the cutting edge of technology through work with aerodynamics and the development of a wind tunnel program. Crawford Composites produces a full range of products, ranging from carbon fiber brake ducts and cold air boxes to custom designed products that are manufactured to suit the customer's individual needs. Most recently Crawford Composites completed the in house design and production of a prototype Sportscar, the Crawford SSC2K. www.crawfordcomposites.com

About Sprint Nextel

Sprint Nextel offers a comprehensive range of wireless and wireline communications services bringing the freedom of mobility to consumers, businesses and government users. Sprint Nextel is widely recognized for developing, engineering and deploying innovative technologies, including two robust wireless networks serving 53.6 million customers at the end of the first quarter 2007; industry-leading mobile data services; instant national and international walkie-talkie capabilities; and a global Tier 1 Internet backbone. For more information, visit www.sprint.com.