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PRESS RELEASE for Immediate Publication

## Michelin and Voyantic Working Together to Overcome the Challenge of Tire Tag Quality Assurance

Compagnie Générale des Établissements Michelin, one of the world's largest tire companies, embeds EPC Class 1 Gen 2 passive ultra-high frequency (UHF) radio frequency identification tags into tire sidewalls during the manufacturing process. This allows for example the city's bus-fleet operators or Michelin's staff to use RFID to automatically identify each tire at the time that its pressure is being measured and more generally allows a cradle to grave traceability.



The Michelin RFID tag is typically buried in the tire during the manufacturing process, but can also be integrated into a patch for aftermarket applications. The quality assurance based on performance testing is essential to guarantee that each and every tag has the same properties. After being embedded in a tire, the tag cannot be replaced anymore, should it function poorly. The Voyantic Tagsurance UHF production tester was the solution meeting the specification for testing the Michelin tire tags.

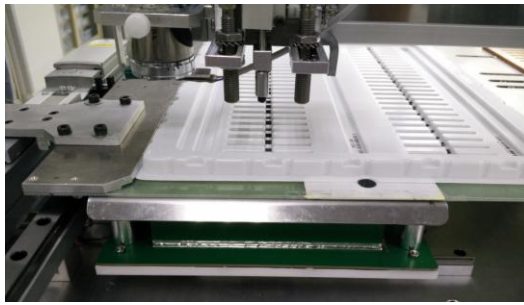
"RFID UHF tags for tire applications are significantly over tuned because of tire material properties and this makes RF performance - i.e. read distance control - more complex to perform "in air" compared to more common tags. This challenge can be solved from an industrial standpoint if:

1. the system can properly process each individual tag test without direct contact;
2. test can be done reliably with a large quantity of other tags in the surroundings;
3. the production flow itself is improved and accelerated.

All this has been achieved today, thanks to our partner Voyantic, and this will lead Michelin to supply an improved RFID reading capability over volumes for its customers! ", explains **Julien Destraves**, Tire RFID expert from Michelin.

### Automated Test System for Tire Tag Testing

The Michelin tire factory uses the Voyantic Tagsurance-based Manual Test Station to perform sample based check and analysis for the incoming tags. At the tag manufacturing plant, the same Voyantic system has been seamlessly integrated by **HANA Microdisplay Technologies, Inc.** into a precision actuator assembly. With this test system Hana Microdisplay is able to 100% guarantee the quality of the tags.



This is how **John Erdmann**, the President and CEO of HANA Microdisplay Technologies, Inc. sees the challenges of RFID testing and the role of good equipment in overcoming those challenges:

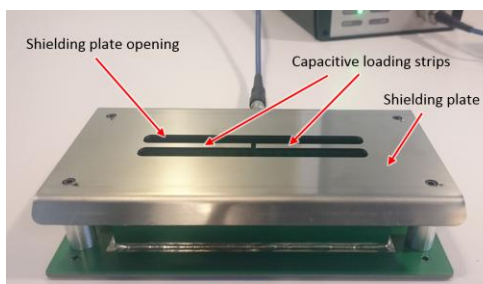
“Hana Microdisplay produces many types of RFID products and systems. There’s always a challenge in doing accurate and relevant RFID testing quickly and cost effectively. With the Voyantic system Hana’s automation engineers were able to integrate a high-level of testing into the process without sacrificing throughput. The data output of the system also allows us to provide more accurate feedback to both our customers and manufacturing lines, to help them design better products and processes. After understanding the capabilities of the Voyantic system during the project with Michelin, Hana Microdisplay chose to implement a Voyantic test system in its most recent roll-to-roll, web-based, high-speed RFID inlay manufacturing line. Hana is also considering retrofitting its older high-speed inlay manufacturing lines to include Voyantic systems.”

### **High Performance UHF Tags with Stable Quality without Bottleneck in Process**

The performance testing provided by the Tagsurance UHF production tester allows not only checking that the tags are functional, but that their performance is stable and thus quality is controlled. Accurate variance data enables detecting any drifts immediately, to execute corrective actions even before the quality falls out of acceptance levels. RF testing used to be one of the bottlenecks in the tire tag production process; now with the Tagsurance this bottleneck is removed and the slowest processes are mechanical ones.

### **The Solution to Overcome the Challenge of High Resonance Frequency**

As the UHF tags manufactured by Hana Micro Display to Michelin are embedded in tires, they will be surrounded by rubber and metal mesh structures, which very heavily detune the tags. To compensate this detuning, the tag is significantly over-tuned to ~2GHz resonance frequency in air environment. To enable testing the tags, some modifications were done on the Snoop Pro coupling element, which is the component developed by Voyantic for reliable testing in near field. The shielding plate structure on top of the Snoop Pro allows only one tag to respond at a time. In this solution the shielding plate was custom designed with an additional capacitive loading structure. The structure is cut into two parts from the center to prevent direct shorting resulting in two separate capacitive loading strips. The strips are electrically connected along the opening edges. Optimizing this path length lets the Snoop Pro coupling element mimic the tag loading the tire would generate.



To learn in detail, how the tag responses are detuned by this specifically designed test setup for highly over-tuned tags, please read the whole story at: [http://voyantic.com/michelin\\_tire\\_tags](http://voyantic.com/michelin_tire_tags).

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