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**MobileMark**  
antenna solutions



THE ANTENNA

## SMWG-311

Multiband WIDEBAND  
Surface Mount Antenna



3-Elements in ONE  
FOAM-FILLED RADOME

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### CASE STUDY

Michelin Launches the

## Michelin MEMS 4

With SMWG-311 Vibration Resistant Multiband Antenna.



### THE CUSTOMER

Michelin, a French multinational company specializing in the design and distribution of tires, services and solutions best suited to customers' needs. As a leader in mobility, it is committed to improving its customers' mobility in a sustainable way; to designing and delivering the tires, services and solutions that best meet customers' needs.

They have invented a variety of tires for applications in multiple industries. Working with well-established customers in the mining community, they chose Mobile Mark's SMWG-311 antenna as the antenna solution for their MICHELIN MEMS 4 platform including Tire pressure Monitoring System.

The MICHELIN MEMS 4 platform including Tire Pressure Monitoring system is a powerful solution to manage tires and usage conditions. It combines downtime-fighting features, innovative equipment, and seamless connectivity to increase profits and reduce downtime by protecting your people, tires and equipment.



## THE ANTENNA MANUFACTURER

Mobile Mark Designs and Manufacturers  
mobile, infrastructure  
and device antennas for wireless  
applications from 30 MHz to 7.2 GHz.

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## THE CHALLENGES

- Too many antennas; too long to install
- Older wireless technology was still being used
- Coverage was difficult due to mining environment

The previous tyre monitoring system used multiple antennas to cover 3G, WiFi and GPS. The system needed to be consolidated and updated to cover new frequency bands. Data needs to be reliably transmitted both in-close to vehicle and from all corners of the mining field, and in a harsh, high vibration environment.

## THE SOLUTIONS

- Multi-band package containing all antennas in one housing
- Upgrade from 3G to 4G Cellular, and from GPS-only to GNSS system
- Use vibration minimizing construction for vehicle antennas
- Identify optimum mounting location for widest RF coverage
- Install new, stronger, mounting bracket for antenna

The new system combined the multiple antennas into a single package covering the additional frequencies used by the upgraded systems. The interior of the antenna housing was filled with an RF compatible foam using a proprietary foaming system to ensure both vibration protection and wireless performance. A new mounting bracket was selected which allowed the antenna to be placed where it could provide the best coverage both near to the vehicle and at a distance. The new bracket was strong enough to provide additional protection from vibration.

## THE ANTENNA

- SMWG-311: 3-element ( 4G LTE Cellular, WiFi, & GNSS )
- Measurements: 107 mm diam. x 81 mm tall ( 4.2" x 3.2" )

Efficiently designed WiFi and Cellular antenna connections are essential for reliable coverage. In-house electrical testing facilities, including an in-house anechoic chamber, Mobile Mark engineers verified the antenna's RF characteristics. The in-house mechanical testing ensured the antenna meets the rigorous Shock & Vibration standards. Throughout the process, Mobile Mark's engineers were available for consultation and advice.