

# Production Test

## Function Test of Tire Pressure Monitoring Systems

### TEST & MEASUREMENT

#### Your task

You need to automatically check each tire pressure monitoring sensor that is built into a wheel and wireless-connected with the onboard electronics for proper function and adherence to measurement tolerances. You also need to document the test results for each sensor.

Each tire pressure sensor is a potted, LSI module that is screw-connected to the valve or fastened with a wheel strap. It primarily contains a sensor chip with a microcontroller and a transmitter for generating the RF signal in an ISM

frequency band (ISM = industrial, scientific, medical).

The sensor determines not only the tire pressure but also the acceleration affecting it and the tire temperature.

Wireless transmission of data to the receiver in the vehicle (three to five data packets per minute in a moving vehicle) is performed via one of the license-free ISM radio bands, e.g. 433 MHz or 896 MHz in Europe, 315 MHz or 915 MHz in the USA and Japan, or 2.4 GHz worldwide.

#### T & M solution



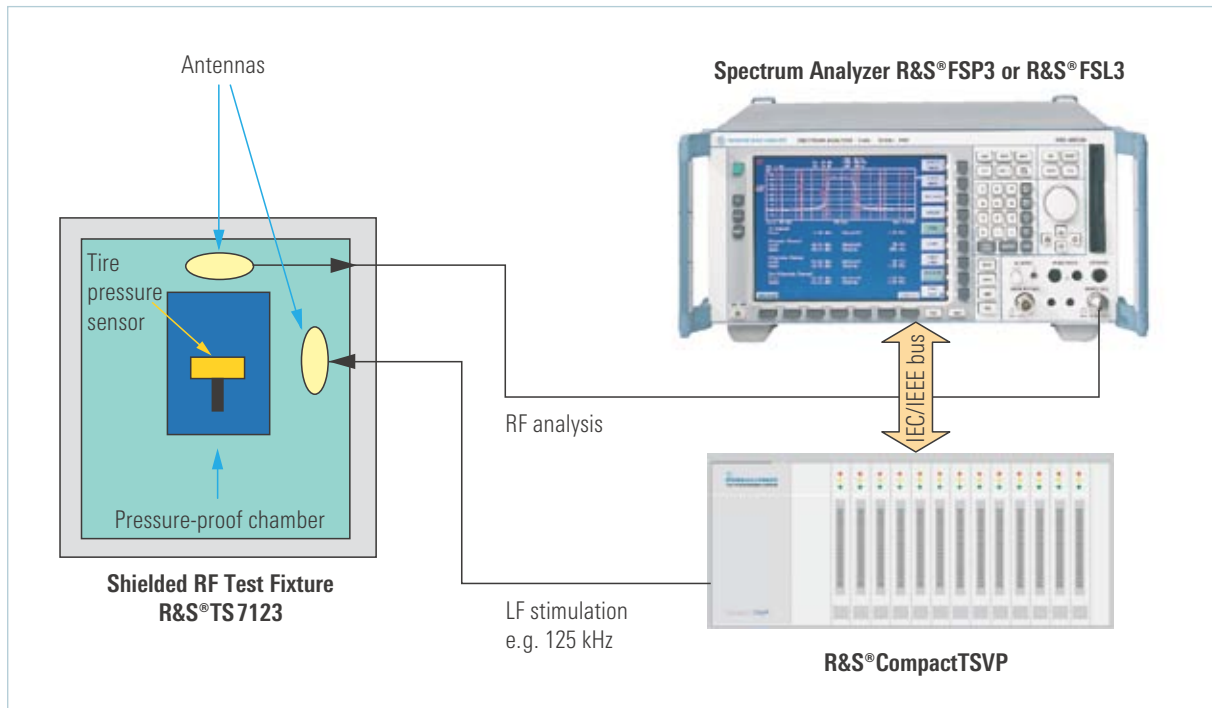
The RF Test System R&S®TS 7810 was designed specifically for automatically checking tire pressure sensors. It consists of a hydraulic test fixture with a pressure-proof chamber for holding the DUT and a 19" rack containing RF test instruments as well as the Open Test Platform

R&S®CompactTSVP. You can easily add auxiliary components such as an RF generator to the system. This may be necessary, for example, when you need to test the counterpart of the pressure sensor, the receiver chip.

## Application

A low-frequency stimulus signal triggers the tire pressure sensor to transmit its data. The RF data telegram is picked up by an antenna in the test fixture and analyzed or demodulated in the spectrum analyzer. The system software evaluates the information, makes a Go/Nogo decision, converts the information to graphic format and documents

the measurement. The integrated Open Test Platform R&S® CompactTSVP can be expanded with additional CompactPCI/PXI cards as needed, e.g. for communicating with the production cell. Various robotic solutions are available for automatically changing DUTs.



## Technical information

<b>Ordering information</b>	RF Test System R&S® TS 7810
<b>System components</b> (basic configuration)	<ul style="list-style-type: none"> <li>19" system rack, 15 height units</li> <li>Open Test Platform R&amp;S® CompactTSVP with R&amp;S® GTSL system software</li> <li>Spectrum Analyzer R&amp;S® FSP 3 or R&amp;S® FSL 3</li> <li>Shielded RF Test Fixture R&amp;S® TS 7123 with pressure-proof chamber and pressure regulator</li> </ul>
<b>Condensed data</b>	
RF frequency range	9 kHz to 3 GHz (covers all ISM frequency bands introduced worldwide)
Measurement time incl. DUT response time	typ. 10 s per DUT (DUT-dependent)
Measurement and processing time only	typ. <0.3 s per RF telegram
Clock time	typ. <20 s with automatic changing of DUT



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