

IR TPMS WHEEL UNIT SENSOR



InfraRed TPMS System (IR TPMS) wheel unit sensor is an evolution of current Tire Pressure Monitoring System (TPMS) technology.

This version introduces the ability to measure the tire carcass temperature in real time via an infrared element mounted in the wheel unit sensor.

The inner tire carcass measurement is a measure of the tire's bulk temperature. This provides information on the mechanical grip available from the tire, which relates to the long-term behavior of the tire.

The infrared element has a total Field of View of 110° which can be angled to cover the maximum area of the inner tire carcass. This FoV is sub-divided into 16 pixels (each of which has a 6.9° Fov), that the customer is able to select 5 of, prior to the build of the sensors, to have their measured temperatures transmitted as part of the sensor's datagram.

The wheel unit sensor detects a pressure change greater than or equal to 200mbar/minute at any time it will enter a fast transmit mode, where it transmits 255 datagrams at a rate of 1Hz.

When the wheel sensor detects that it is spinning at a speed greater than 30kph, it enters its driving mode and starts transmitting datagrams at 1Hz. The sensor remains in this mode until it stops rotating and after 7mn. The sensor can also be setup at build time to enter this mode if its ambient temperature is above a pre-defined threshold, and it remains in this mode until the temperature drops back below the threshold.

Each wheel sensor is identified by a unique 4 Bytes serial number, and customers are supplied with a permit list containing all of their wheel sensors.

SPECIFICATIONS

ELECTRICAL

- Supply Voltage - Internal 3V
- Lifetime (typical) - 1 season

PRESSURE

13.7mbar/bit Sensor

- Pressure Range 0 - 3.50 Bar
- Pressure Resolution 13.7mbar/bit
- Accuracy ± 30 mbar

TIRE CARCASS TEMPERATURE

- Temperature Range $-50^{\circ}\text{C} +205^{\circ}\text{C}$
- Temperature Resolution 1°C/bit
- Accuracy (worst case) $\pm 3.0^{\circ}\text{C}$
- Accuracy (best case) $\pm 1^{\circ}\text{C}$

INTERNAL TEMPERATURE

- Temperature Range $-40^{\circ} - 125^{\circ}\text{C}$
- Temperature Resolution 1°C/bit
- Accuracy $\pm 0.5^{\circ}\text{C}$

GENERAL

- Transmit Rate
 - Park Mode - No Data
 - Driving Mode 1Hz
 - Paddock Mode 0.1Hz
- RED / FCC certification
- Operating Temperature Range $-20^{\circ}\text{C} - +125^{\circ}$ (peak 150°C)
- Mass $46\pm 1\text{g}$
- LF Triggering features - 125KHz
- RF Frequency - 433.92MHz