

Technical Description

Users Manual

5WY7635

User Manual / Functional Description

of the

Siemens VDO

Tire Pressure Generation TG1B-VL2 wheel unit

**Type
5WY7635**

1.1. SYSTEM OVERVIEW

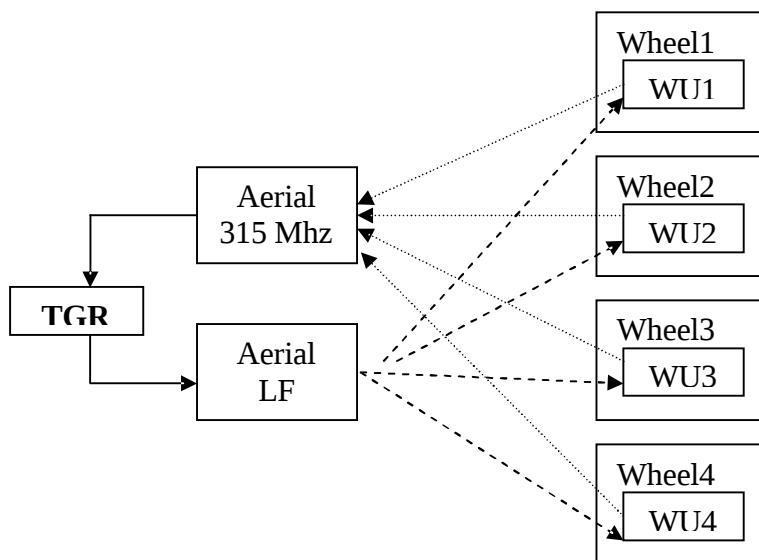
The TG1B-VL2 is a pressure sensor for Tire Pressure Monitoring System (TPMS) application.

By several measurements and RF transmission, the driver is informed about the air pressure in his vehicle wheels.

The following is a list of the wheel unit (WU) functions:

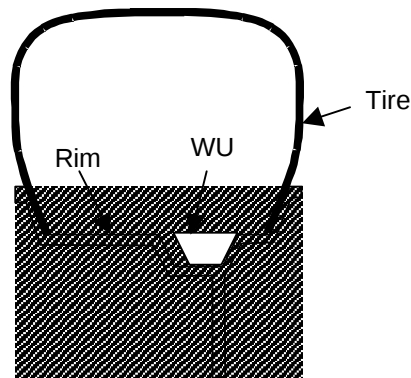
- Pressure measurement
- Temperature measurement
- Motion measurement (centrifugal acceleration)
- Battery status
- Radio frequency RF emission
- Low Frequency LF reception

The system is made of an embedded WU that measures some parameters inside the tire and transmits them by RF at 315 MHz to a central unit (TGR) in the vehicle. In some cases, the TGR can trigger a RF emission from the WU by LF signal.



LF triggering is made by some specific LF drivers and antennas. RF reception is made by one antenna linked to the TGR. LF triggering is only used in case of axle localization.

The WU is mounted inside the wheels, fixed to the rim, which is also a part of the System.



It is made of a PCB that supports the electronic hardware encapsulated inside a box and polyurethane foam. It is self-powered by a battery and includes all systems for measurements (pressure, temperature, centrifugal acceleration, and battery status), RF emission and LF reception.

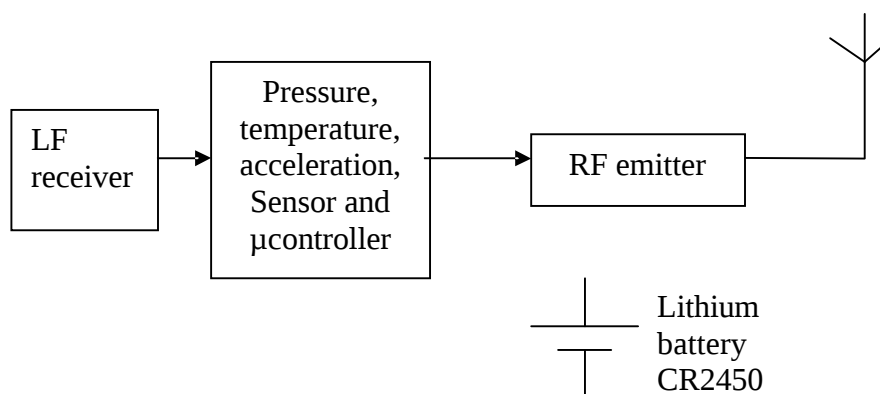
Theory of Operation

The sensor function is to provide to the receiver by RF frames the state of pressure of the air in each one of the four tires of the car. The information given in the RF frame indicates exactly the state of the car (rotating wheel or not) and the state of the pressure in the tires.

At any time, the sensor must be able to detect some changes of the wheel behavior. When the motion indicator is activated, the sensor enters the rotating mode. When the motion indicator is deactivated, the sensor enters the interim mode for maximum half an hour. During this period, the vehicle car return in rotating mode if it restarts before the end of the 30 minutes stopped period or after 30 minutes time in interim mode, the sensor goes automatically in stationary mode until it restarts and goes in rotating mode.

1.2. BLOCK DIAGRAM

The block diagram below shows the main electronic units of the wheel unit:



1.3. VARIANTS

Siemens type designation	Remarks
5WY7635	Transmitter 315 MHz

1.4. TYPICAL USAGE PATTERN

One burst of 4 frames of 10.41ms per minute
=> in one hour $= 4 \times 0.0104 \times 60 = 2.5$ seconds of transmission duration.

Transmitter ON 2.5 seconds / hour

Transmitter OFF 3597.5 seconds / hour

Duty Cycle: $T_{ON} / T (ON+OFF) \times 100\% = 2.5 / 3600 \times 100\% = 0.069\%$

1.5. TECHNICAL DESCRIPTION VARIANT 5WY7635

Carrier Frequency	:	315 MHz
Field strength	:	< 87 dB μ V/m @ 3m (CW mode)
Frequency shift	:	$\pm$ 35 kHz target value ($\pm$ 30 kHz min to $\pm$ 50 kHz max)
Number of channel	:	1
Type of modulation	:	FSK-ASK
Antenna	:	Integral
Voltage supply	:	1 lithium battery 3V (CR2450)
Voltage supply range	:	2.1 up to 3.2 V

1.6. LABEL DESIGN CANADA, USA, MEXICO

Siemens VDO
5WY7635
FCC ID:KR55WY7635
IC:267T-5WY7635

owner manual: warning statement

This device complies with part 15 of the FCC Rules and RSS-210. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

Note:

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.