Users manual
For RDKS® Battery-less TPMS

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1. Purpose and scope of this document

This document describes the installation, operation and regulatory requirements for RDKS® Battery-less Tire Pressure Monitoring System (TPMS) .

2. Installation

2-1. Installation requirements

A TPMS system consists of the following components:

- Car terminal
- Display
- Cable harness (to connect Car terminal with the Display and Power supply from car battery (ex. via cigarette socket))
- 4 Wheel-arch Antennas each with 350cm length coaxial cable plus connector(FAKRA)
- 4 Tires with installed wheel terminal.

Please refer to Fig.-1 for a pictorial view of the related TPMS components.

2-2. Installation procedure

a) Install the wheel-arch antennas in the front-left, front-right, rear-left and rear-right, tire-house of the car.
b) Put the Car terminal underneath the passenger seat, or in one of the Glove compartments(location may vary depending on user preference), and connect the car terminal to the antennas by coaxial cables.
c) Place the Display in the center console panel and connect it to the car terminal by the Cable harness.
d) Connect the cable harness to the cigarette socket as a power supply.

The below picture Fig. -1 shows an image of installed TPMS in a vehicle.

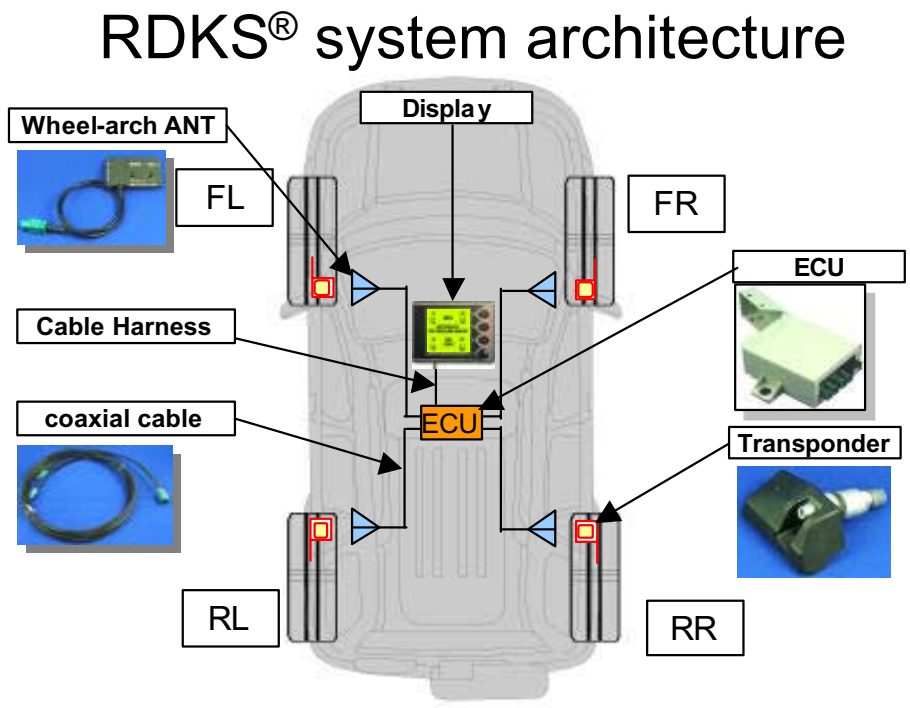


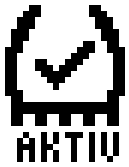
Fig.-1 : TPMS system architecture

3. Operation

The following section explains the functional operation for the TPMS system in the car.

a) Turn on the car ignition which will supply power to the car terminal.
b) Check the status of 4 tires by looking at the Display, some tires may not display any information, because they may be out of their respective Inquiry angle ranges.
(Check the status of the four tires by the display. Some tires may not display any information, because they are out of the operate angle.)

After power on, but before a valid reading is sent from the tire, the “INAKTIV” icon will be displayed.



After one revolution of all four wheels the “AKTIV” icon should be displayed.

c) After one full tire revolution, all states of air pressure, and temperature measurement data are displayed.
d) If after step c) there are still no readings on the display, the antenna, the transponder, and the tire are checked to find the non-functional unit.

4. Operation sequence of the measurement

The TPMS measures the tire air pressure (and temperature) according to the following sequence of events:

4-1. Interference detection

Before the measurement, radio noise and interference from other equipment is checked. If this level is above a predetermined level, a different frequency carrier channel is used.

4-2. Transmission

The electric wave which puts the AM modulation on the carrier frequency in the 2.4GHz carrier is transmitted.

4-3 Reception

The carrier frequency without the modulation is transmitted. The electric wave modulated from the transponder is received. The frequency of the modulation by the transponder depends on the pressure/temperature sensing.

4-4. Calculation

The electric wave related the measurement is stopped and the micro controller of the system calculates from the frequency of the modulation, pressure/temperature readings.
(The micro controller of ECU calculates tire air pressure and temperature using received modulation frequency.)

The method of measuring each tire is performed in a random fashion.
At high speeds this gives a better distribution of temperature/pressure readings for each tire.

5. Eligibility requirements for regulatory approval

As a part of regulatory certification, IQ-mobil will provide an approval for certain countries in the form of modular approval (MA).
The regulatory approval is required for each country throughout world where the end-user wishes to use TPMS into entire end product, if no certification program for the modular approval exists in the country.
The countries that can accept MA include the USA, Canada, and certain European countries.
The conditions for approval of IQ-mobil's TPMS and related information for each country are described below.

5-1. Compliance statement to FCC

The TPMS complies with part 15 of the FCC rules. Operation is subject to the following conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received, including interference that may cause undesired operation.

5-2. RF exposure compliance

The TPMS is intended to be installed into a vehicle for Tire Pressure (and Temperature) monitoring applications. Because the system only radiates very low power levels, it complies with RF exposure requirements.
According to Supplement C, Edition 01-01 to OET Bulletin 65, Edition 97-01 spread spectrum transmitters are categorically excluded from routine environmental evaluation because of the low power level, where there is a high likelihood of compliance with RF exposure standards.

5-3. Requirements to end product

The following provisions for end product will be required on the FCC regulation, part 15.

5-3-1. Wheel-arch Antenna

IQ-mobil wishes that customer(s) can use the TPMS without any modifications including antenna. If customer uses a unique antenna, the FCC certification is required for the end product.

5-3-2. Markings

To satisfy FCC exterior labeling requirements, the following text must be placed on the exterior of the end product.

FCC ID: RXB-RDKS

Any similar wording that expresses the same meaning may be used.

5-3-3. Caution to user for modification

The following caution shall be expressed on the user's instruction manual.

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device.

5-3-4. Compliance statement to FCC

The following statement shall be expressed on the user's instruction manual.

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

6. Caution

6-1. Life Support Applications

The TPMS is not designed for use in life support appliances, devices or systems where malfunction of this product can reasonably be expected to result in personal injury. IQ-mobil customers using or selling this product for use in such applications do so at their own risk and agree to fully indemnify IQ-mobil for any damages resulting from such improper use or sale.

7. Revision History

Revision	Date of issue	Contents of change	Author
Rev. 1.0.0	30.Mar, 2004	Initial issue	IQ-mobil
Rev. 1.0.1	01.Apr, 2004	Text modifications	IQ-mobil