

Tubeless Tyre Pressure Monitoring Using Arduino Uno

Mrs.V.Sundarajayalakshmi¹, A.Karthikeyan², S.Manjunathan³, K.Mohammedsharieff⁴,
V.Radha Krishnan⁵.

Assistant Professor, Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India ¹,
UG Students, Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India ^{2,3,4}

ABSTRACT: The project proposes a method to implement tyre pressure monitoring and accident avoiding system in vehicles. At exceptional state to ensure the safety of driving, which is life safeguard pre-warning system for passengers and drivers. The unit includes Barometric sensor, an Arduino Uno, Arduino Nano, RF module, LCD and Buzzer. TPMS unit displays real-time tire pressure of the tyres. Warning is generated whenever tyre pressure crosses the minimum threshold level.

KEYWORDS: Arduino Nano, Arduino UNO, BMP 180, 433 MHz RF module.

I. INTRODUCTION

The project proposes a method to implement tyre pressure monitoring and accident avoiding system in vehicles. At exceptional state to ensure the safety of driving, which is life safeguard pre-warning system for passengers and drivers. The unit includes Barometric sensor, an Arduino Uno, Arduino Nano, RF module, LCD and Buzzer. TPMS unit displays real-time tire pressure of the tyres. Warning is generated whenever tyre pressure crosses the minimum threshold level.

II. EXISTING METHOD

TPMS was used to measure the tyre pressure using Arduino Uno and a Barometric sensor. Results of pressure sensor will be displayed onto a LCD. This system will alert the driver by giving a warning sign or with a buzz sound. The connection between the sensor and Arduino Uno is wired.

III. PROPOSED METHOD

User can monitor the tyre pressure wirelessly (RF). The system has a Wireless communication enabled. Results of pressure sensor will be displayed onto a LCD. This system will alert the driver by giving a warning sign or a buzz sound. User can check the pressure with high precision.

IV. METHODOLOGY

A. SYSTEM DESIGN

When the power supply is turned ON, the Barometric sensor will detect the air pressure at its surrounding (i.e. inside the tyre) and transmit the information wirelessly with the help of Arduino Uno and RF Transmitter

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module. At receiver side the RF Receiver module will accumulate the signals and it will feed data to Arduino Uno. The Arduino Uno at receiver side will process the data which have been sent by RF Receiver and display the results in the LCD. If the Arduino Uno detects the PSI(Pressure per Square Inch) falling below the safe threshold level, a warning sign will be displayed on the LCD.

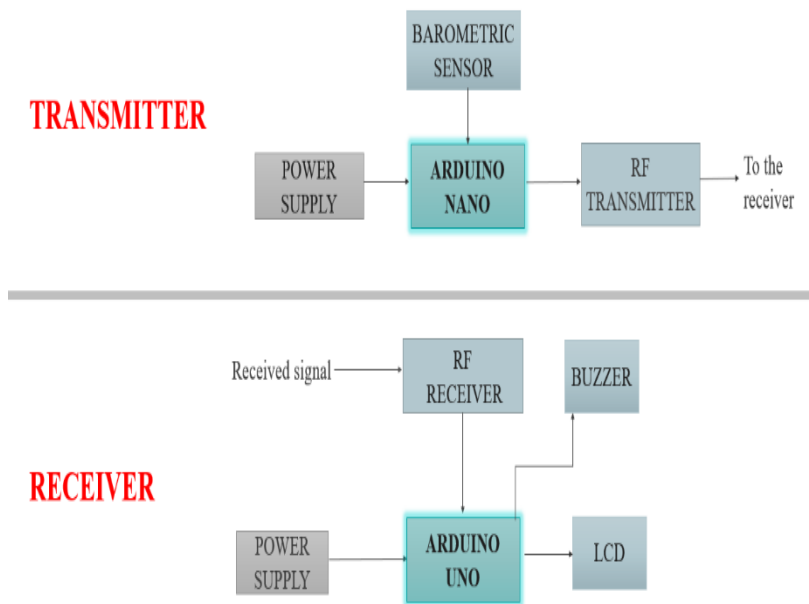


Fig 1. Block diagram of transmitter and receiver

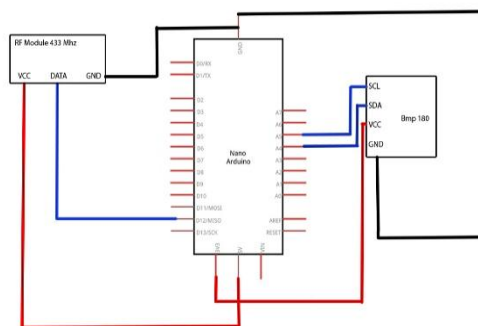


Fig 2. Transmitter

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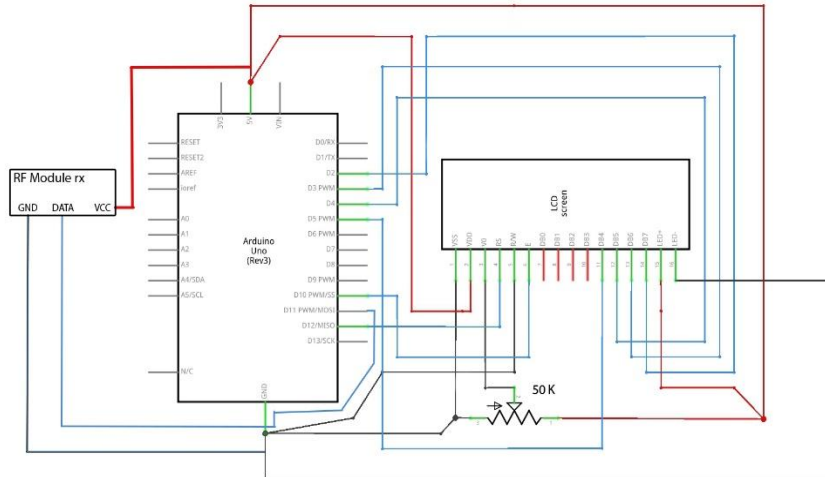


Fig.3. Receiver

V. EXPERIMENTAL RESULT

If the Arduino Uno detects the PSI(Pounds per Square Inch) falling below the safe threshold level, a warning sign will be displayed in the LCD. Air pressure of the tyre will be displayed in either PSI.The receiver side will be connected to the battery of the bike.

The communication will be enabled wirelesslyThe transmitter part can be placed at the mouth of the tyre.The tire pressure monitoring systems based on wireless sensor technology discussed here can also be used in wide range of applications.

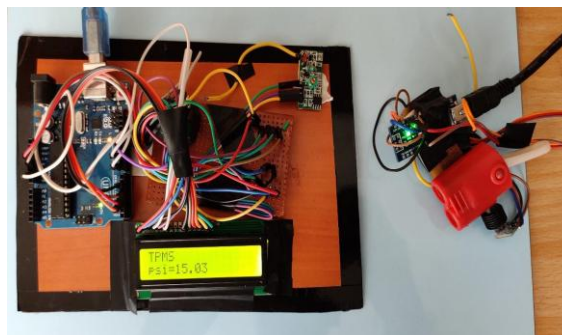


Fig 4. Picture of Transmitter and receiver

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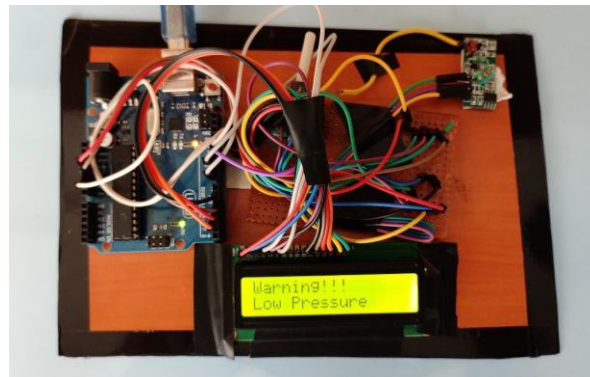


Fig 5. Experimental Setup

VI. CONCLUSION

This system utilizes integration techniques to provide a solution to measure real-time tyre pressure, temperature and also alerts the driver about improperly inflated tyres. This system is an essential feature in all the vehicles.

The system ensures calibrated tyre pressure which is important for tyre life, reduce number of accidents, proper handle of vehicle. Further this system can be developed into Nano sized and implement water resistant property to ensure safety of the bike riders.

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