SMART SYSTEM FOR VEHICLE EMISSION TESTING

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ABSTRACT

The monitoring and detecting the vehicle, which is polluting our atmosphere is becoming a major problem in many countries. With the ever increasing number of vehicles on the road, the Traffic Monitoring Authority has to find new methods of overcoming such a problem. Considering that the transport sector is responsible for an increasingly important share of current environmental problems, we look at Intelligent Transportation Systems (ITS) as a feasible means of helping in solving this issue. In the system proposed, we detect the vehicle, which is polluting our atmosphere is identified through a compact circuitry comprising of PIC16f877a controller, CO_2 sensor, GPS and GSM. The CO_2 sensor is used to detect the how much gas released by the vehicle. In controller we fixed some threshold value from that controller identify the abnormality, then send the warning message to the user. If till abnormality is increase then controller track the location using GPS and send the information to the user and also engine (motor) is switch OFF. This system is a realistic concept and can be applied to automatic vehicles emission testing.

Key words: Intelligent transportation system, GPS, Zigbee.

INTRODUCTION

The main objective is to develop a small, comfortable and user friendly device, to detect CO_2 emission from vehicles. The monitoring and detecting the vehicle which is polluting our atmosphere is becoming a major problem in many countries. With the ever increasing number of vehicles on the road, the Traffic Monitoring Authority has to find new methods of overcoming such a problem. Considering that the transport sector is responsible for an increasingly important share of current environmental problems, we look at Intelligent Transportation Systems (ITS) as a feasible means of helping in solving this issue[1-3].

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Proposed system architecture

In the proposed system we detect the vehicle, which is pollute our atmosphere for that we use PIC16f877a controller, CO_2 sensor, GPS and GSM. The CO_2 sensor is used to detect the how much gas is released by the vehicle. In controller we fixed some threshold value from that controller identify the abnormality, then send the warning message to the user. If till abnormality is increase then controller track the location using GPS and send the information to the concerned authority and also engine (motor) is switched OFF[4-6].
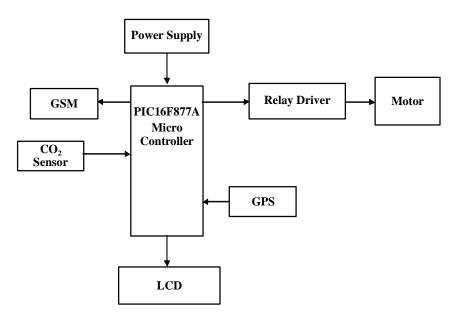

Fig. 1: Block diagram of vehicle emission testing

Fig. 2: User unit

Hardware circuit and output

Power supply unit[6-8]

Given input: 230V, 5A, 50 Hz AC Supply

Expected output: 12V, 500 mA- 1A, DC Voltage

Microcontroller unit: PIC Microcontroller

Given input

The sensors output is given to the controller input that check details

Expected output

The Zigbee is fetched by the microcontroller to send the detected value to control section.
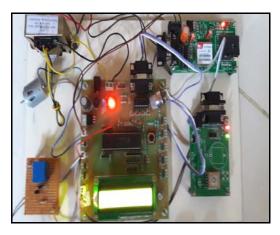
Display unit: LCD

Fig. 3: Hardware circuit of vehicle emission testing system

Given input: The text from the microcontroller indicating the device status is given as input to the LCD.

Expected output: The received text is displayed on the LCD.

The following LCD display shows the sensor information, and the information communication to the concerned authority.

Fig. 4: Display output

CONCLUSION

In this system, we represent an automatic vehicle emission testing process based on CO_2 sensors. The CO_2 sensor is detecting CO_2 emissions from the different vehicles. When the excess amount of CO_2 is released from the vehicles, a SMS sent to the concerned user. If the user is not responding then the vehicle is automatically turned off.

In the future work we can implement mobile alert system for communication from substation to the concerned persons if excess emission of CO_{2s} detected by the system. We can also implement its PC connectivity so that it alerts a person through E-mail. To alert a group of people we can use voice automated alert.

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