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IOT Based Fault Detection in Vehicle with Smart Locking System

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Abstract:- Vehicle Monitoring plays an important role. Components in vehicle if not observed can cause major problems during driving the vehicle. The proposed paper gives proper result by keeping crucial considerations in view. The Tire pressure observing system described in referred papers uses RS232 and Bluetooth modules which have downside of limited operating range. This paper offers the design of using Internet of Things which will increase the operating range for the proposed system. The advantages of design proposed by this paper are depletion in number of accidents, to increase the life and strength of tires, fuel Mileage of the vehicle, performance of the engine, fuel level monitoring, reduce difficulty during driving and to provide proper vehicle monitoring information are displayed on the physical interface using IOT. The prime objective of this project is to reduce human efforts. Automation has always been a major aspect for security system. Our goal in the project is to design and implement a security system. System that giver full controllability through a hand-held smart-phones by means of IOT.

Keywords:- *Atmega16, LCD Display 16x2, Pressure Sensor, Temperature Sensor, Wi-Fi Module.*

I. INTRODUCTION

Vehicle monitoring system is an electronic system that observes the tyre pressure, engine temperature, Battery level of vehicle in real time and alerts the driver as well as server by use of LCD Display and IOT respectively. There are several components in vehicle such as decrease in tire pressure, Tire bursting, tyre puncture, drop in fuel mileage, sudden fall in Parameter's degradation in engine performance which results in several downsides. This paper presents a vehicle monitoring system that depletion in number of accidents, increase mileage, braking efficiency, improve tyre life, helps in proper handling and maintenance of vehicle. This system is controlled by a Atmega16 microcontroller that is loaded with an embedded C program.

All parameters are displayed on the physical interface using Internet of Things.

II. HARDWARE REQUIREMENT

- ATMEGA16 MICROCONTROLLER
- ESP8266 WI-FI MODULE
- HC05 BLUETOOTH MODULE
- HX710B PRESSURE SENSOR
- LM35 TEMPERATURE SENSOR
- HW201 IR SENSOR
- 16*2 LCD DISPLAY

III. BLOCK DIAGRAM

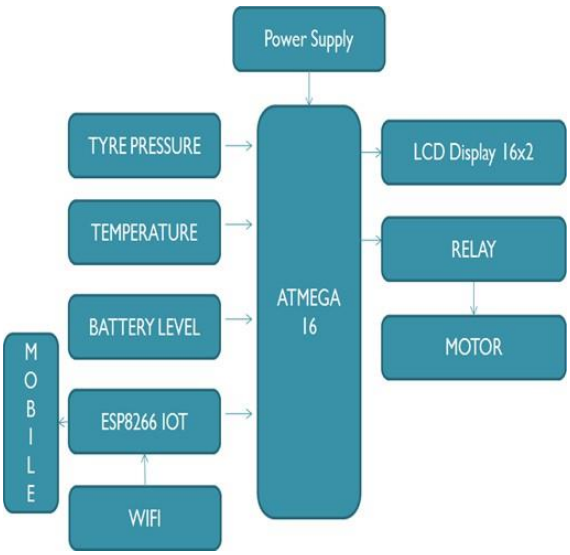

Diagram 1

In this vehicle monitoring system we have implemented various components i.e., Tyre pressure, Engine Temperature, Battery Percentage. The output of the components is in analog to convert it into digital signal it is connected to Atmega16 microcontroller ADC Port.

And it will show the result to the user on smartphone through IOT.

If someone is going to steal the vehicle, the theft system will be activated and a alert message is send to the user. Then the user can lock the engine as theft is detected

IV. CIRCUIT DIAGRAM

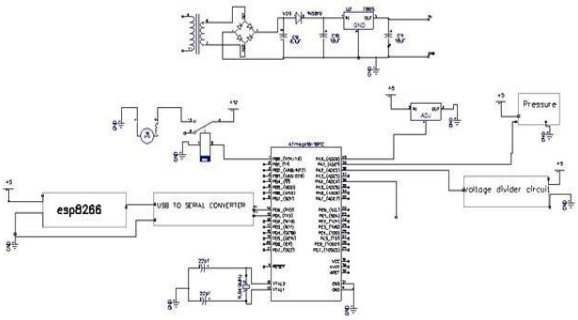

Diagram 2

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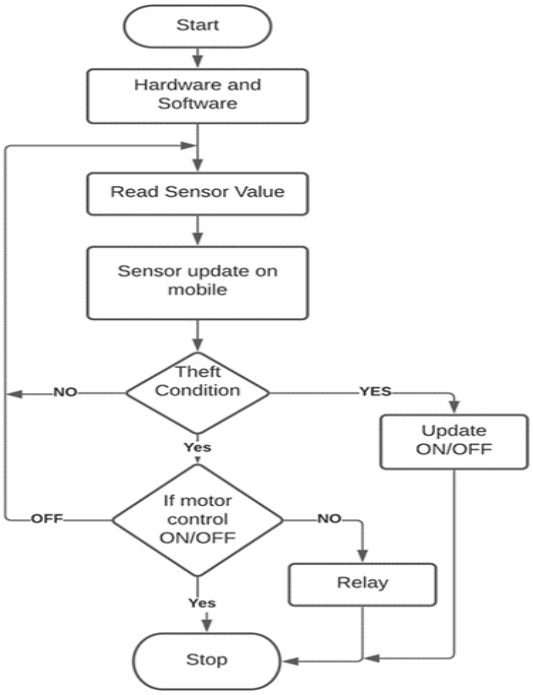
V. FLOWCHART



Flow chart 1

- Our system helps to save vehicle from theft issue.
- Our system can be implemented on low cost.
- Informs in case of any problem in engine, battery, and tyre pressure.
- Helps to reduce car failures.
- Improves engine life

VI. RESULTS

Fig. 1: Monitoring Details on LCD

Fig. 1 Shows Monitoring Details on LCD Display. It measures and Shows Temperature of the engine, Battery percentage, tyre pressure in real time.

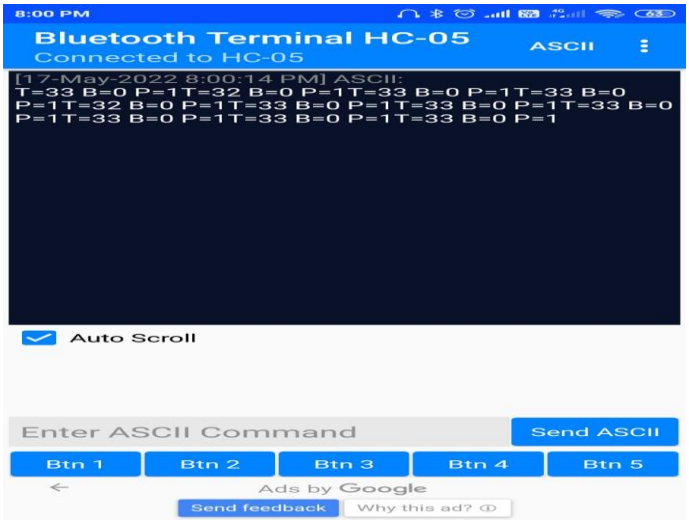


Fig. 2: Monitoring Details on Smartphone

Fig. 2 Shows the monitoring details on the smartphone via Bluetooth module. It uses hc05 Bluetooth module to transmit the data. It shows the temperature of the engine, Battery percentage, tyre pressure of the vehicle in the HC05 Bluetooth terminal app on smartphone.

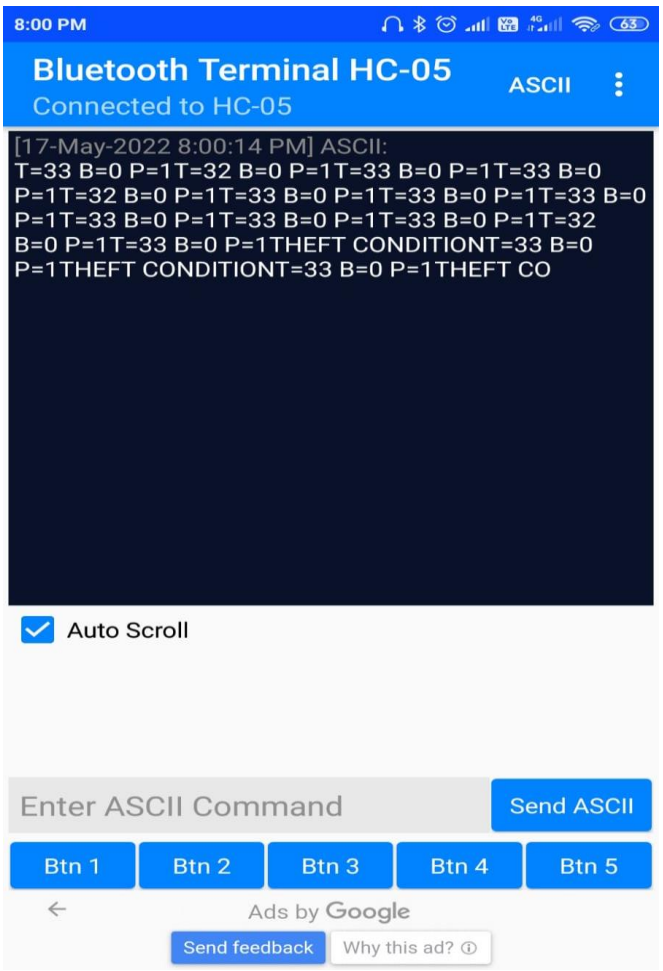


Fig. 3: Theft Condition Detected

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Fig. 6.3 Shows the theft condition on the HC05 Bluetooth terminal app. When the theft is detected by the Infrared IR sensor it transmits the signal to the user via Bluetooth, so that user can switch off the car using relay.

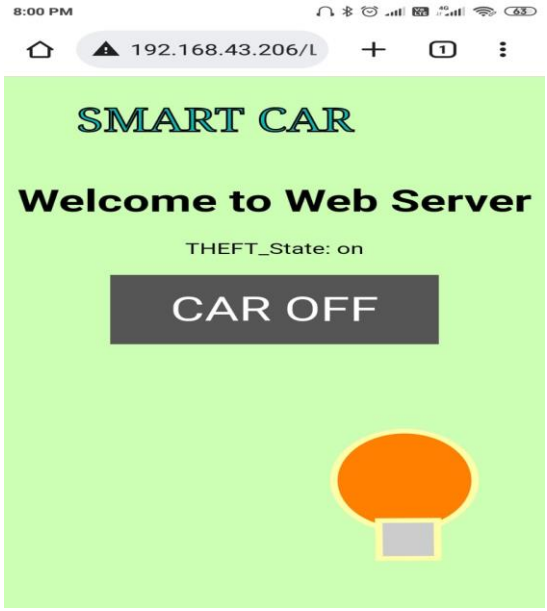

Fig. 4: Theft condition is on, ignition Switch is off

Fig. 4 Shows the theft condition activated. When the unusual activity is detected by the Infrared IR sensor, it informs to the user by using ESP8266 wi-fi module in real time. When the theft is detected on the webpage user can turn off ignition of the car by clicking car on/off button on a webpage. It will turn off the motor by using relay. We can also switch it on through remotely using relay.

VII. CONCLUSION

The conception of vehicle fault detection and theft control is not a new one. However, it should extensively spread it is important to aim for a system that properly is able to accomplish all the requirements of high-end vehicle to low end models. The system equipped 3 detection parameters with 2 add on parameter as per user. This project assures that, if this system is brought into practice, it will minimize the rate vehicle failure and accidents.

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