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Connecting Helmet and Bike Using Thermal Sensor

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Abstract: *A helmet is a type of protective headgear used by the rider which makes bike riding safer than before. The primary purpose of this helmet is to provide safety for the rider and make riders wearing helmets mandatory for starting their motorcycle. This can be implemented by using a thermal sensor to detect human temperature. It is mandatory to wear the helmet, without which the ignition switch will not turn ON. An RF module is a wireless communication between transmitter and receiver. If the rider doesn't wear a helmet, the rider couldn't start the bike. The peculiarity of the project is connecting two external sources using the thermal sensor.*

Keyword: *Arduino; Thermal sensor; Ignition switch; Wireless communication; Transmitter; Receiver.*

I. INTRODUCTION

In recent times helmets have been made compulsory in all over the states . Traffic accidents in India have been increased every year. As per Section 129 of Motor Vehicles Act, 1988, every person riding a motorbike is mandatory to wear protective headgear following the standards of BIS (Bureau Indian Standards). Currently bike riders easily escape from the law. These are the main issues which motivates us for implementing through this project. The first step is to identify whether the helmet is worn or not. If the helmet is worn the ignition will start otherwise it remains off. For this, Thermal sensor is used. The thermal sensor used as a connector in which the helmet is mandatory thing to start the bike. The thermal sensor senses the temperature of the human who is wearing helmet, after the detection of temperature it sends the signal to Arduino uno and it sends signal to rf transmitter which transfers signal to receiver that is fixed in the bike. The signal received from the transmitter is then passed in to Arduino nano and then a buck converter is used to reduce the power from the bike battery. All these connections made the bike to turn on and the rider can ride their bike safely.

II. MATERIAL AND METHODS

Thermal Sensor

The MLX90614 ESF shown in fig 1 is an infra-red thermometer for non-contact temperature measurements. Both the IR-sensitive thermopile chip and the signal conditioning ASIC are integrated into the same TO-39 can. This sensor plays a vital role in our project. The primary thing is to sense the human temperature who is wearing the helmet. This type of sensor actually identifies the human using IR and such that the temperature can be identified and it offers a standard accuracy of plus or minus 0.5 degrees. Compared with traditional thermometer, the infrared thermometer is safe to use and has convenient measurement and short measuring time.

Fig:1

Arduino UNO

Arduino UNO shown in fig 2 is an open-source microcontroller which can be easily programmed, erased and reprogrammed at any instant of time. Based on microcontroller boards, it is an open-source computing platform that is used for constructing and programming electronic devices. Arduino uses a hardware known as Arduino development board and a software called Arduino IDE. This plays main role in this project. It receives the signal from the thermal sensor only if the given range satisfies or else it will not pass to the next transmitter part.

Fig:2

Arduino NANO

The NANO shown in fig3 is equipped with the ATMMega4809 microcontroller and an energy efficient processor. This has a role where the signal from the helmets receives from the transmitter and it opens the way to turn on bike ignition through relay. The main commitment of this sensor in our project is to receive the signal from the RF module and makes a way to ignition.

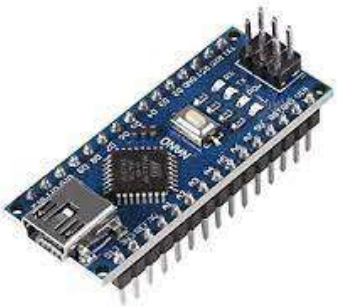

Fig:3

RF Module

Radio frequency (RF) shown in fig4 is any of the electromagnetic wave frequencies that lie in the range extending from around 3kHz to 300 GHz, which includes those frequencies used for communications or radar signals. The study of radio propagation allows estimates of useful range to be made. The use in the project to implement a communication bus bar to show communication between transmitter and receiver via Arduino.

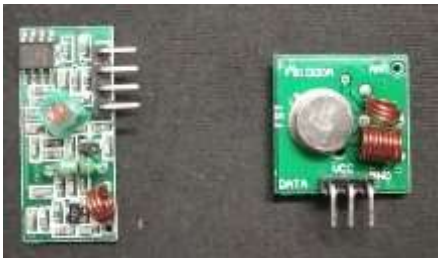

Fig:4

Buck converter

DC-DC buck converters designed to step down 5V DC Voltage source to 2V and 3V DC output voltages. It has four connections one from the voltage to come and another is to down the voltage and use that. This actually acts as a bridge between two external chips to adjust the voltage. Low pass filter is included to produce purely output voltage.By varying the duty cycle of the buck converter the output voltage is varied proportional to the voltage needed for the NANO and RF boards.

Fig:5

III.RESULT

Getting references from various books and findings, research about every component their working, internal and external qualities we have converted our study into a product that will be useful in our society. this idea is fool proof, highly effective as it will forcibly compel people to wear helmets or else they can't use their vehicle

IV.CONCLUSION

The project carried out by us made a task in the field of automobile department. This project has also reduced the cost involved in the concern. Project has been designed to perform the entire requirement task which has also been provided. The designed Smart helmet ensures the safety of the rider by making it necessary to wear helmet, If any of these prime safety rules are violated, the proposed system will prevent the biker from starting the bike. This ensures that the victims get proper and prompt medical attention, if he/she met with an accident. Preventing a huge number of accidents in the future. The thermal sensor gives uniqueness to our project by Implementing our idea this can be changed as essential one for riding bikes. Our proposed idea lies in the way It tackles the problem from its roots and even in its ability to change people's compromising attitude

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