SWAYANSHU
SATYAPRAGYAN SAHU

Class: VIII

PM Shri KendriyaVidyalaya
Bargarh

TOPIC

SMART HELMET

(Lets the bike to start if only if the rider has won a helmet)

INTRODUCTION

Motorcycles are the craziest vehicle among the young generation as well as in the world. Motorcycle safety related to different features of the vehicle such as equipment, model design of the vehicle along with operator skill is special for motorcycle rider. They are the most unsafe road users without a protective body. Even the slightest carelessness can have serious injuries or may lead to death of the rider.

The death of the people may occur due to the following reasons:

1. Over speeding 2. Rash driving 3. Consumption of alcohol
4.Violation of traffic rules

But the main reason for brain damage and death is only because of the absence of the helmet. If the rider wears the helmet, 80% chances are there to avoid head injuries and a life can be saved.

In recent times helmets have been made compulsoryin India. Traffic accidents in india has been inceased eevery year. As per Rule ,every single person riding a two wheller is required to wear protective headgear following the the standard BIS (Bureau of Indian Standards).

The first step to identify wheather the helmet is worn or not. If helmet is worn then ignition will start otherwise it remains off. For this , Force Sensing Sensors (FRS) sensor is used. The second step is alcohol detection. Alcohol sensor is used as breath analyser which detects the presence of alcohol in rider's breath and if it exceeds permissible limit ignition cannot start.MQ-3sensor is used for this purpose., When these two conditions are satisfied then only ignition starts. The third main issue is accident and late medical help. If the rider has met with an accident, he may not receive medical help instantly, which is one of the main reasons for death. Every second people dies due to delay in medical help, or in the case where the place of accident is unmanned. In fall detection, we place accelerometer in the bike unit. By this mechanism accident ca be detected.

The aim of this project is to make a protection system in a helmet for the safety of bike rider. The Smart helmet that is made is fitted with different sensors responsible for detection. There are two main units in this project. Each unit uses a micro controller . Signal transmission between the helmet unit and bike unit is done using a RF module.

What is smart Helmet?

Smart helmets have the same basic appearance as standard hard hats, but they have built –in technologies such as tracking tools ,sensors and augmented reality.

What is the purpose of Smart Helmet ?

The purpose of smart helmet is to provide safety by providing the information of surroundings by using the technology and allow the user to access his/her phone functionalities by his/her voice.

What is the importance of helmet?

Studies have shown that wearing a helmet reduces your risk of a serious brain injury and death because during a fall or collision, most of the impact energy is absorbed by the helmet rather than your head and brain.

According to the investigation in India, nearly 25% of the road accidents are caused by two wheelers. The foremost causes for the fatalities are due to drunken driving, rash driving, and drowsiness due to long drive. The aim is to build an interesting smart helmet that protects us from accidents and indicates the accident prone area. Here we are using various sensors to build the smart helmet.

To detect alcohol consumption of the rider we use Alcohol sensors. In order to check a rider's helmet,an infrared sensor can be used. Vibration detector is also added to the hemet to indicate the harsh hitting of the helmet during an accident. When the two wheelera slide down due to road rashes,the GPS is used to identify the location of the accident spot and quickly sends messages (location) to police stations and hospitals nearby through GSM.

Applications

1.It can be used in real time safety system.

2.we can implement the whole circuit intosmall VLSI chip that can be embedded into the helmet and bike unit.

3. It can be designed for less power onsuming safety system.

4. This safety system technology can further be enhanced in car or other vechile by replacing the helmet with seat belt.

Future Scope

1. We can implement various bioelectric sensors on the helmet to measure various activities.
2. We can use small camera for recording the drivers activity. It can be used for message from the one vehicle to another vehicle by using wireless transmitter.

PROBLEM STATEMENT

Helmets are the first line of defence against injuries due to road accidents for motorists.

*In India 70-85% deaths of motorists ,due to accidents happen because of not wearing a helmet.

* The major reason people don't wear helmets in India is because of their compromising attitude- They prefer Comfort over safety.
* Therefore the problem is to tackle this stubborn attitude of people and make sure that they wear helmets always.
* We cannot control the occurrences of accidents but taking precautions to avoid life-threatening injuries due to road accidents is in our hands- by wearing helmets.

SOLUTION

This problem can be solved effectively by letting the vehicle to start and run only if the rider has worn a helmet and vehicle would shut down immediately if the helmet is removed.

* **The safety feature will have two parts**:-

On helmet :will have FSR and IR sensors working with Arduino. It will continuously relay data to vehicle,about the helmet being worn or not.

On Vehicle: This Aurduino will act as a safety switch on the vehicle's electrical circuit . It will turn on if helmet is worn and turn off if not worn,based on the data received.

Both will be connected by bloth module ,therefore each vehicle should have its own unique helmet to be connected.

COMPONENTS

- This section comprises of an alcohol sensor switch, accelerometer, and **RF transmitter.** The switch examines whether the rider is wearing a helmet or not and transmits the signal through **rf transmitter** to bike section

ALCOHOL SENSOR

An alcohol sensor detects the attentiveness of ethanol in the air. When the drunk person breathes near this sensor it discloses.An alcohol sensor detects the attentiveness of ethanol in the air. When the drunk person breathes near this sensor it discloses thealcohol gas in his breath and obtains the output based on alcohol concentration. It is placed in the helmet in such a way that it can easily sense the breath of the person.

RF TRANSMITER: -

Rf modules are 434 MHz transmitter and receiver components rf transmitter is the wireless data that transmits serial data to the Receiver through an antenna which is connected to the 4th pin of the transmitter it transmits the helmet data to the bike receiver through the radio frequency signal and micro-controller will process the received data.

- ## ARDUINO: -

Arduino is the open source platform used for building electronic project it consists of both hardware circuit and software tool and this software is used to wire the code and ide (integrated development environment)using the simplified version of C++.

Thus, it can interact with sensor motor, internet, smart phone and tv android that has varieties of board in the Arduino.

SIM800L

SIM800L is a miniature cellular module which allows for GPRS Transmitter, sending and receiving SMS, AMD making and receiving voice calls.

GPS MODULE

GPS stands for global positioning system and can be used to determine position, time and speed during the journey.

ESP32-CAM

The ESP32-CAM is a small ,low –power camera module that uses an ESP32 chip and an OV2640 **2**- megapixel camera. It has a foot print of 40 x 27mm and can operate independently as a minimum system. The ESP32-CAM has TF card slot, Wi-Fi and Bluetooth connectivity, and a USB type –C port for debugging . It can be used in a variety of IoT applications, such as wireless video monitoring, and Wi-Fi image upload.

Emergency SOS Button

A button on the helmet sends an immediate signal for a quick response in dangerous situation

SOCIAL BENEFITS

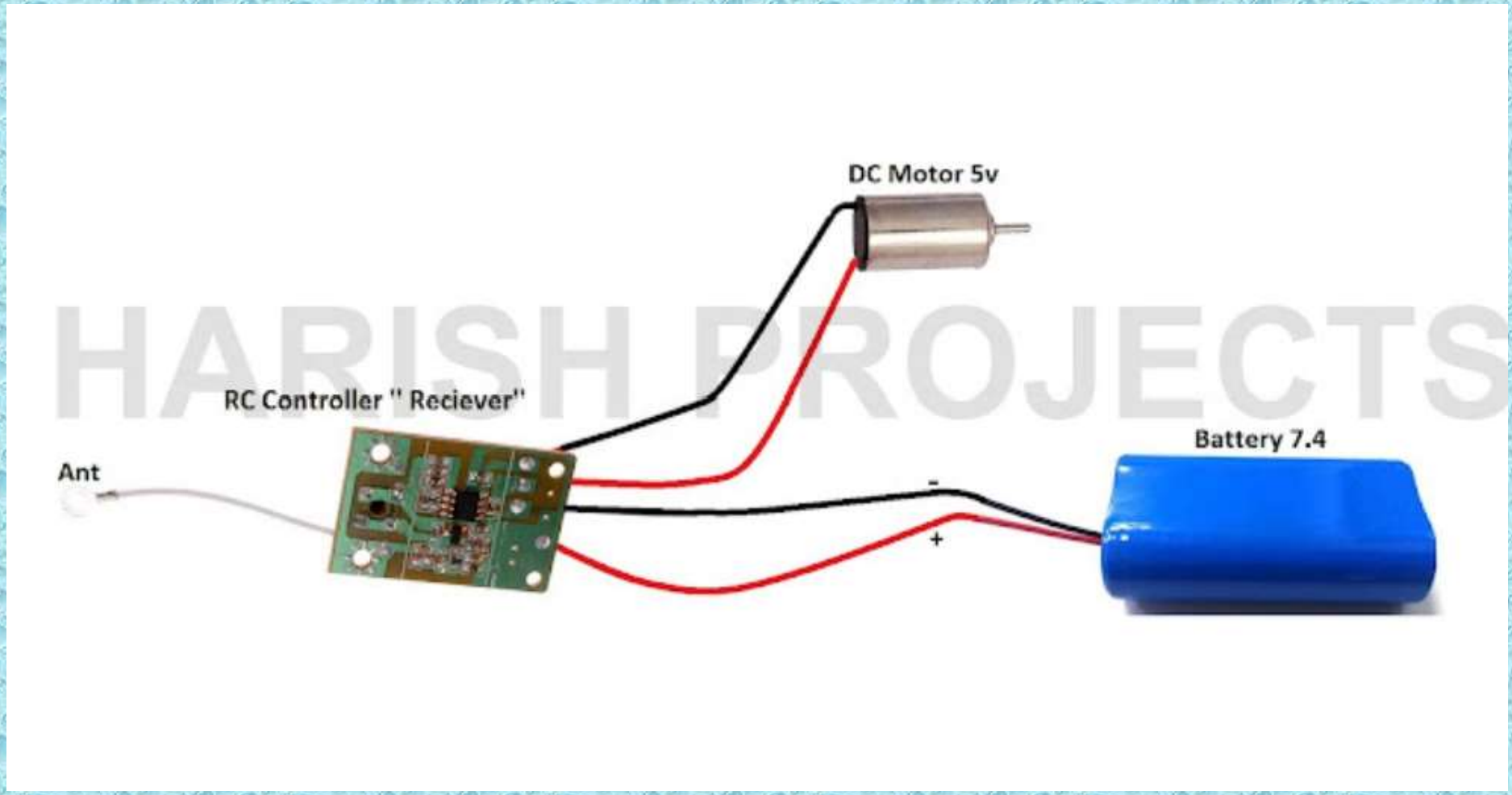
With the help of this new sensor alert system to the rider and modeling the motorcycles with the sensor alert system and making it mandatory for the bike riders to wear this smart helmet while driving. During a recent survey, four people die in road accidents per hour out of which 70% are those who were not wearing helmet. Many people lost their lives in these accident because of the absence of help reached in time. If an accident happens in remote are or where no human help is available then this idea of smart helmet can be of extreme help.

COST EFFECTIVE:PER SET OF THIS TECHNIQUE COSTS RS.4500/-.

Conclusion

The Smart helmet ensures the safety of the rider by making it necessary to wear helmet, and also ensures that the rider has not consumed alcohol more than the permissible limit. If any of these prime safety rules are violated ,the proposed system will prevent the biker from starting the bike. The system will prevent the biker from starting the bike. The system also helps in efficient

handling of the aftermath of accidents by sending a SMS with the location of the biker to the police station. This ensures that the victims get proper and prompt medical attention, if he/she met with an accident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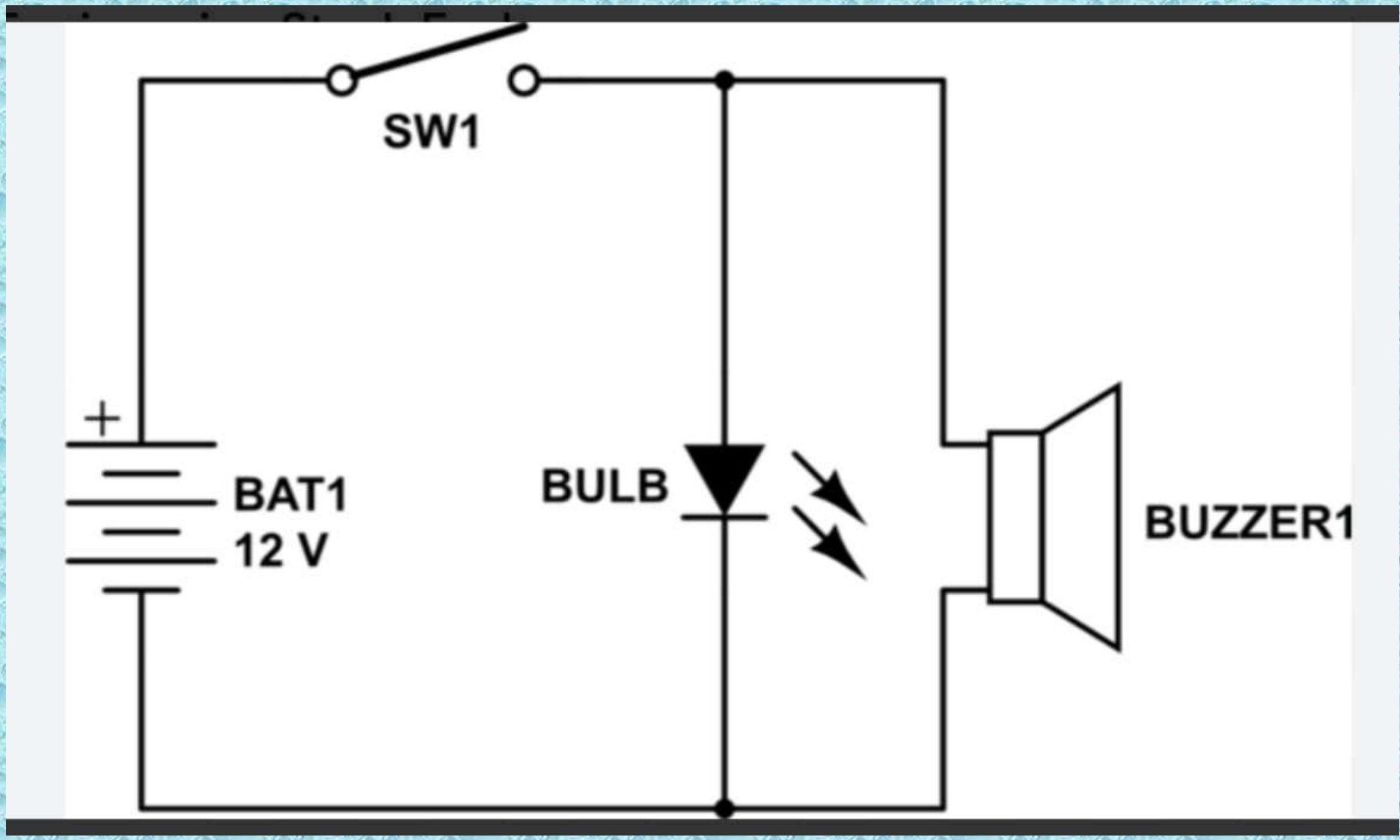
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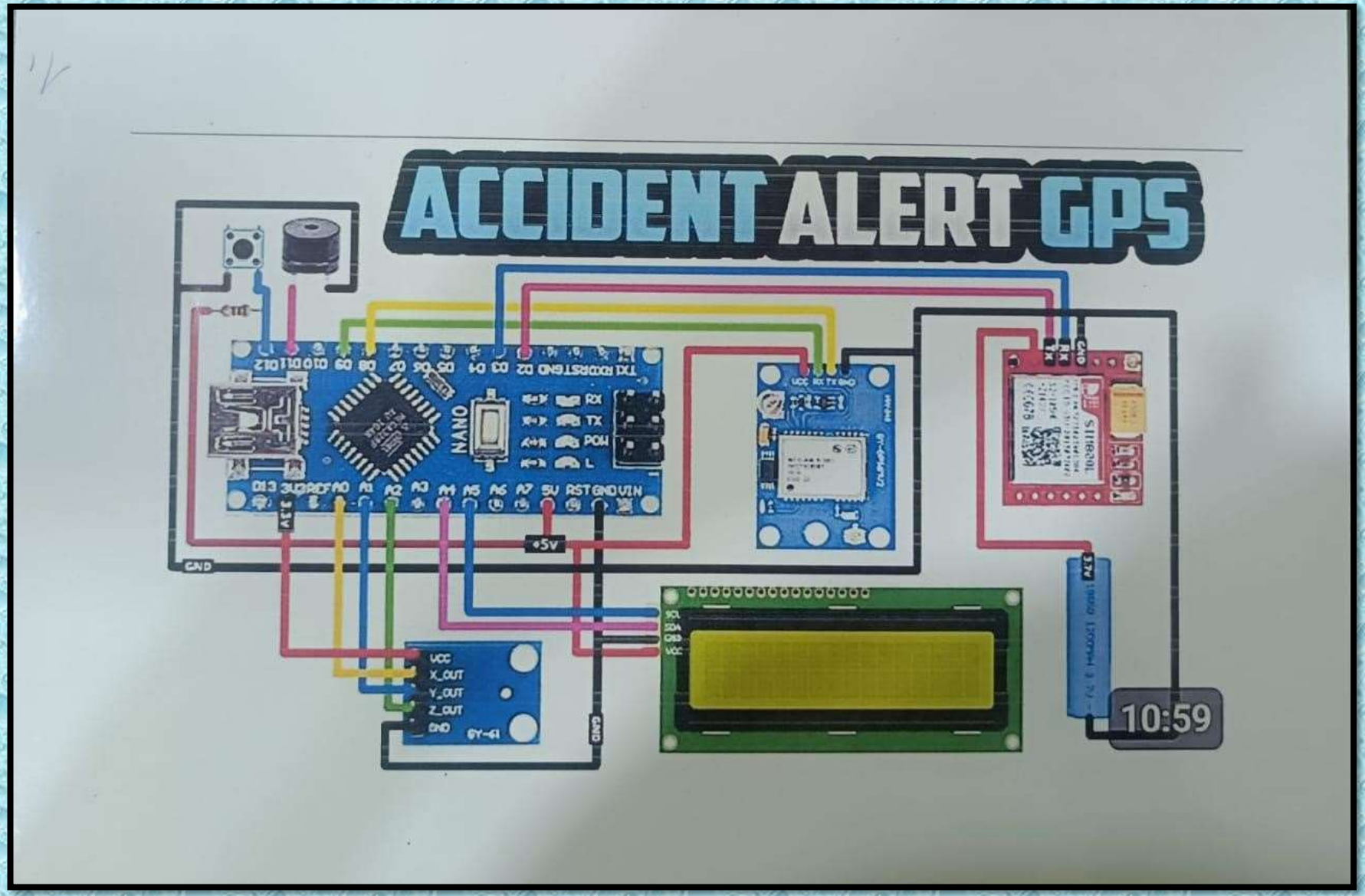
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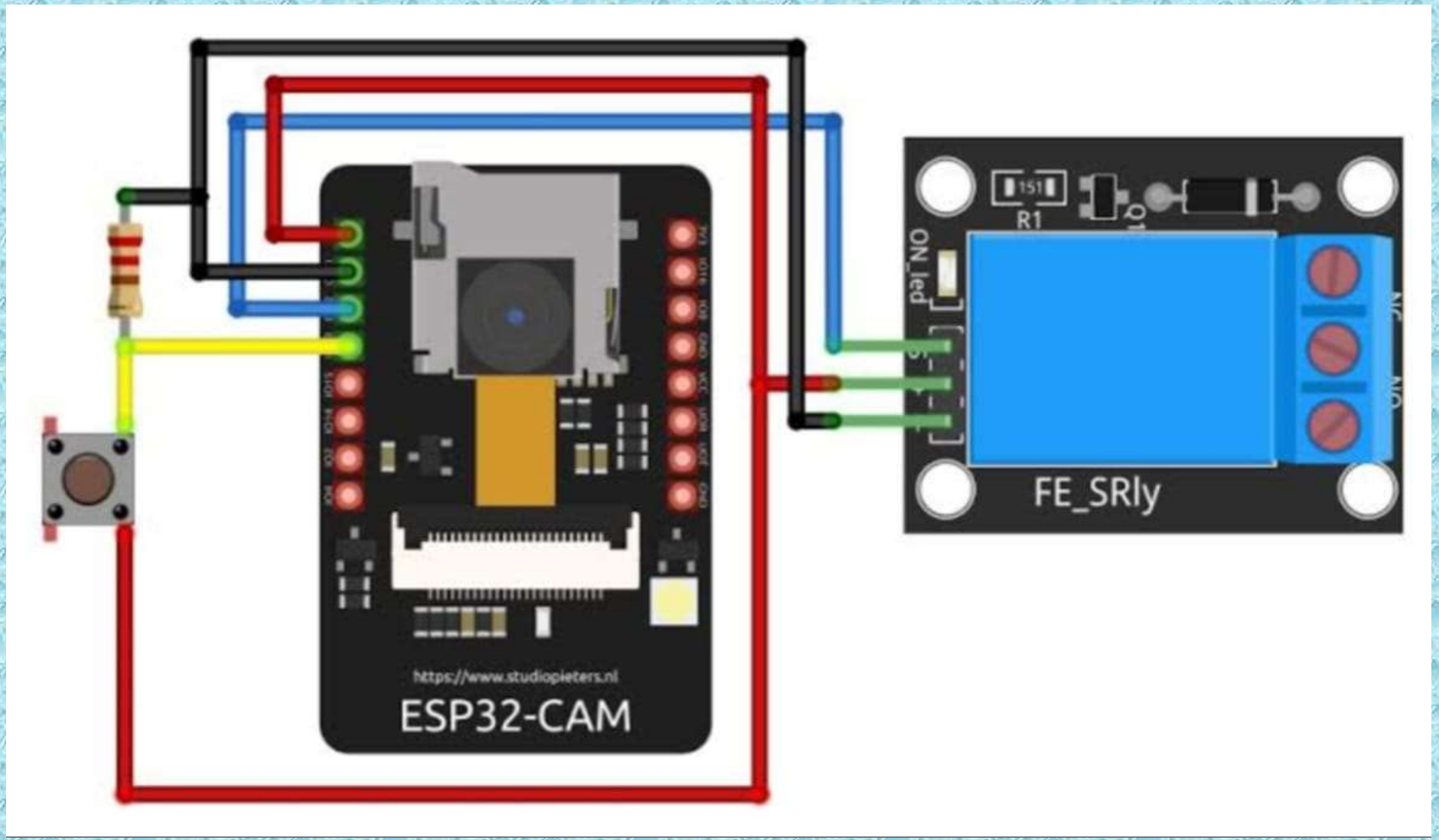
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