

# IOT Based Motor Bike Speed Control System Using Blynk App

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**Abstract:** Nowadays road accidents are occurring frequently, due to rash driving of people. The most unfortunate thing is that by making small mistakes during driving, we lost our valuable future. Parents are more concerned about their children's over-speeding and driving irrationally with their bike. Through this project, parents can determine and control the speed of their children's motor bike. If the vehicle is moving with a speed more than adjusted speed limit then a message will arrive to the blynk app administrators phone showing that vehicle is in dangerous driving. Blynk app is used for controlling and monitoring the speed of bike which can be remotely accessed at any area. Notification of dangerous driving will arrive on blynk app. Once the upper limit is set then it is not possible to increase the speed of vehicle. By this project the parents can take care of their children if they exceed the set speed limit via blynk app on their mobile.

**Keywords:** Blynk app, Internet of Things, Arduino IDE, DC Motor

## 1. Introduction

Most of the fatal or serious accidents are associated with excessive or inappropriate speed of vehicles. Parents are more concerned about their children's overspeeding and driving irrationally with their bike. Through this project, parents can determine and control the speed of their children's motor bike. In this project we show that how we control the speed of a motor bike up to a set value based on IOT. If the vehicle is moving with a speed more than the set value then a message will arrive to blynk app administrators phone showing that vehicle is in dangerous driving. Once the upper limit is set then it is not possible to increase the speed of vehicle. The main objective of the project is to develop an IOT based motor vehicle speed control system to remotely access the speed of a vehicle at any time by an administrator. It will notify the administrator by a text message when the vehicles speed exceeds a particular speed limit which is provided in the blynk app. Administrator can adjust the speed of the vehicle according to the their choice once the specified speed limit exceeded message arrives in the blynk app.

## 2. Description of components

### 2.1 NODEMCU ESP8266

THE NODEMCU ESP8266 development board comes with the ESP-12E module containing ESP8266 chip having TensilicaXtensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and operates at 80MHZ to 160MHZ adjustable clock frequency. NODEMCU has 128KB RAM and 4MB of flash memory to store data and programs. Its high processing power with in-built WI-FI/Bluetooth and deep sleep operating features make it ideal for IOT projects NODEMCU can be powered using Micro USB and VIN pin. It supports UART, SPI, and I2C interface.

#### 2.1.1 Programming NodeMCU ESP8266 with Arduino IDE

The NODEMCU development board can be easily programmed with Arduino IDE will hardly take 5-10 minutes. All you need is the Arduino IDE, a USB cable and the

NODEMCU board itself. You can check this getting started tutorial for NODEMCU to prepare your Arduino IDE for NODEMCU.

#### 2.1.2 NodeMCU ESP8266 specifications & Features

Microcontroller: tensilica 32-bit RISC CPU Xtensa LX106

Operating voltage: 3.3v

Input voltage : 7-12v

Digital I/O Pins (DIO): 16

Analog input pins (ADC): 1

UARTs : 1 SPIs : 1 I2Cs : 1

Flash Memory : 4MB SRAM : 64KB

Clock speed : 80MHz

USB-TTL based on CP2102 is included onboard, Enabling plug n play

PCB Antenna

Small sized module to fit smartly inside your IOT projects.



Figure 1: NODEMCU ESP8266

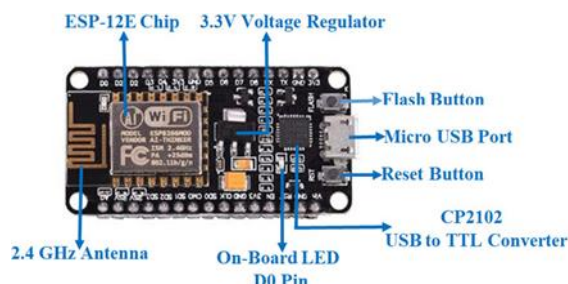


Figure 2: NODEMCU ESP8266 with Arduino IDE

## 2.2 Potentiometer

Potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as a variable resistor or rheostat. The measuring instrument called a potentiometer is essentially a voltage divider used for measuring electric potential(voltage); the component is an implementation of the same principle, hence its name. potentiometers are commonly used to control electrical devices such as volume controls on audio equipment. Potentiometers operated by a mechanism can be used as position transducers, for example, in a joystick.

Potentiometers are rarely used to directly control significant power(more than a watt), since the power dissipated in the potentiometer would be comparable to the power in the controlled load.

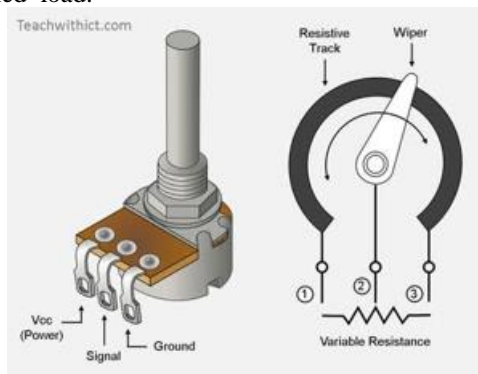


Figure 3: Potentiometer

## 2.3 Motor controller L293D IC

The L293D is a popular 16-pin motor driver IC. As the name suggests it is mainly used to drive motors. A single L293D IC is capable of running two dc motors at the same time; also the direction of these two motors can be controlled independently. So if you have motors which has operating voltage less than 36v and operating current less than 600mA, which are to be controlled by digital circuits like OP-AMP, 555 timers, digital gates or even Micron roller like arduino, PIC,ARM etc.

## 2.4 DC Motor

A Dc motor is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. The Dc motor is the motor which converts the direct current into the mechanical work. It works on the principle of Lorentz law, which states that “the current carrying conductor placed in a magnetic and electric field experience a force”. And that force is the Lorentz force.



Figure 4: Motor controller L293D IC



Figure 5: DC Motor

## 2.5 Blynk App

BLYNK is a platform with IOS and android apps to control arduino, raspberry pi and the likes over the internet. It is a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets. Blynk app allows to you create amazing interfaces for your projects using various widgets we provide. Blynk server – responsible for all the communications between the smart phone and hardware. You can use our blynk cloud or run your private blynk server locally.

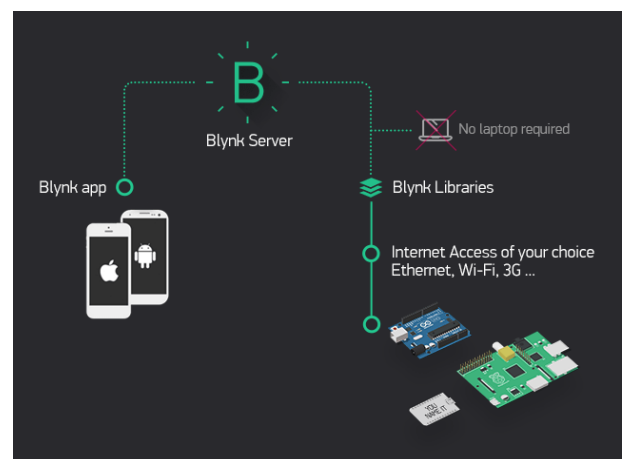


Figure 6: blynk app

## 2.6 Power Supply

A Power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, frequency to power the load.

### 3. Literature Review and Literature Gap

K. N. V Satyanarayana (2018) in this paper proposed a new way for controlling the speed of the vehicle without harming others. In this paper, we are using RFID module to limit vehicle speed. The RF transmitter will be placed at first and last of the restricted areas and RFID receiver should be placed inside the vehicle. the vehicle speed was obtained by speedometer which is available in vehicle. that speed is compared and monitored by the controller. If the vehicle speed exceeds the limit speed, it automatically controls the speed of the vehicle according to that particular zone. Hence, automatically the speed reduced. If there is any emergency, a switch will be available in the vehicle. when the switch is on, the speed is not controlled automatically. The vehicle which is Switched on, that vehicle number was stored in cloud. Here the main purpose of cloud is it loads the route map of the vehicle.

A. Vengadesh, K. Sekar (2015) this paper provides a way for how to control the speed without harming others. Driver does not control anything during such places; controls are taken automatically by the use of electronic system. In this project we using RF for indicating the speed limit areas it is placed front and back of the restricted zones. RF receiver is placed inside the vehicle. Speed is acquired by the help of speedometer in the vehicle. The controller compares the speed. If it exceeds the limited speed the controller alerts the driver and controls taken automatically. If they does not respond that message an information along with the vehicle number is transmitted to the nearest police station by the use of GSM and penalty amount is collected in the nearest tollgate.

Deepa B chavan (2014) in this paper proposed for vehicle safety for passengers in vehicle is an important parameter. Most of the vehicles get accident because no proper safety measures are taken especially at curves and hair pin bends humps and any obstacles in front of the vehicles. This system can be used for the prevention of such a problem by indicating a pre indication and also reducing the speed of vehicle by reducing the fuel rate of vehicle. As the action is in terms of fuel rate so the vehicle automatically goes to control and avoids the accidents. at curves and hair pin bends the line of sight is not possible for the drivers so the special kind of transmitter which is turned at a frequency of 433MHZ are mounted as these transmitters continuously radiate a RF signal for some particular area. As the vehicle come within this radiation the receiver in the vehicle gets activate. The transmitter used here is a coded transmitter which is encoded with encoder.

Bharat Bohara (2020) the project discussed in this paper is targeted at solving sundry problems faced by Nepalese people in their daily life. It is designed to control and monitor appliances via smartphone using WI-FI as communication protocol and raspberry pi as private server. All the appliances and sensors are connected to the internet via NODEMCU microcontroller, which serves as the gateway to the internet. Even if the user goes offline, the system is designed to switch to automated state controlling the appliances automatically as per the sensors readings. Also, the data are logged on to the

server for future data mining. the core system of this project is adopted from the Blynk framework.

S. Vinod Rao, P. Saketh Kumar (2014) in this paper parents smartzone based vehicle speed control using RF and Obstacle detection and accident prevention system. Whenever the vehicle is with in the zone, the vehicle speed is controlled by receiving the signal, every time the vehicle speed is decreased to some cutoff and kept constant until the vehicle moves out of the zone, and then the vehicle can get accelerated by itself. Detects obstacles and prevents accidents by stopping vehicle.

From the literature survey, it is found that most of the resources have implemented only system based on obstacle detection and RFID module for speed control. The conclusion from this was to implement a motor vehicle speed control system, which itself regulates the speed when needed using Internet of Things.

### 4. Methodology

The main methodology depends on IOT based embedded system so interfacing of all hardware with WI-FI and internet is very important part in its functioning. The whole programming is done in Arduino IDE then it is load in the NODEMCU ESP8266 and with the help of WI-FI, potentiometer and DC motor. We can adjust the speed of the motor bike using throttle or accelerometer which is a potentiometer. If a person is riding a motor bike, it is assumed that he can throttle his bike from 0 km/hr to 255km/hr. Blynk app is used for controlling and monitoring the speed of bike which can be remotely accessed at any area. Notification of dangerous driving will arrive on blynk app. We can set the speed notification limit as 100km/hr.

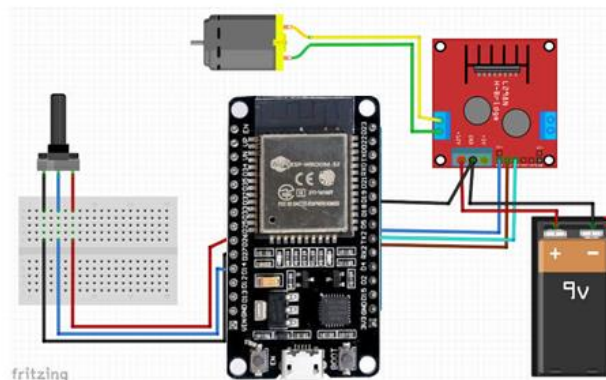


Figure 7: Circuit Diagram

Whenever the driver throttles to a value greater than 100km/hr notification will arrives on the blynk app showing 'DANGEROUS DRIVING'. One who remotely access the notification have the ability to control the speed of me bike using blynk app or he can leave that notification. If he wants to control the vehicle below 100km/hr using slider control provided in the app , he can control the speed by setting the speed value on slider control. Blynk app consists of two gauges throttle gauge and controlled gauge. Throttle gauge shows the maximum speed from 0-255km/hr. controlled gauge shows the controlled speed.

5. Hardware Connection

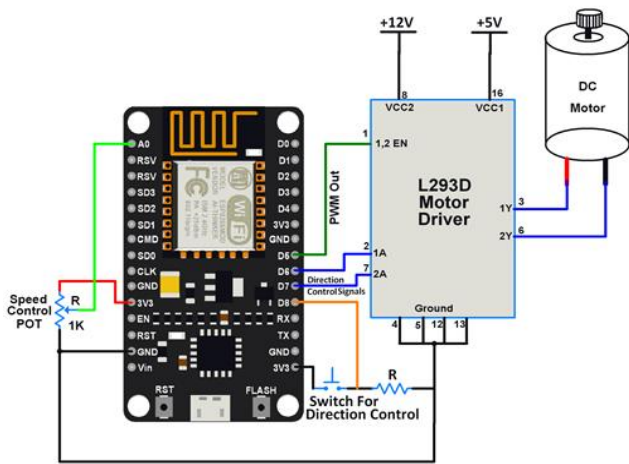


Figure 8: Circuit design

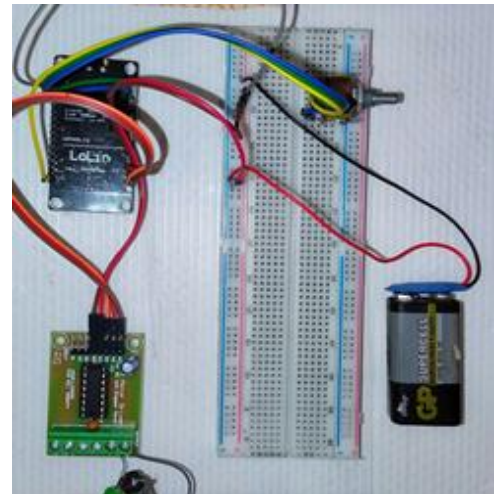


Figure 11: Connection of components

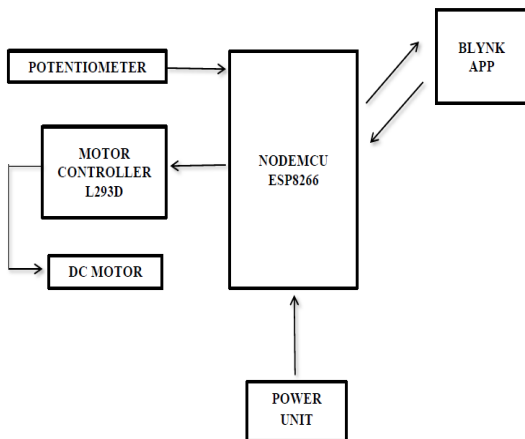


Figure 9: Working of motor bike speed control system

Here potentiometer mimics the accelerator of the motor bike and speed of the DC motor mimics the actual speed of the vehicle. Blynk app should be operated with a wi-fi and Username and Password of the same wi-fi should be added in the program done in Arduino IDE and then it is load in the NODEMCU ESP8266 by which blynk app and NODEMCU ESP8266 is interfaced each other.

```

Motor_Vehicle_control | Arduino 1.8.13
File Edit Sketch Tools Help

Motor_Vehicle_control
/* Interface L298N With NodeMCU
 * By TheCircuit
 */

int ENA = 16; //D0;
int IN1 = 5; //D1;
int IN2 = 4; //D2;

//accelerator with pot
const int analogInPin = A0; // ESP8266 Analog Pin ADC0 = A0
int sensorValue = 0; // value read from the pot
int sensorValue_up=0;
int startMap=0;
int sensorValue_o=0;

#define BLYNK_PRINT Serial

#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

// You should get Auth Token in the Blynk App.
// Go to the Project Settings (nut icon).
char auth[] = "7xWW1FYFSORw8FrdpEtkBMsosk-nls3";

// Your WiFi credentials.
// Set password to "" for open networks.
char ssid[] = "vipul";
char pass[] = "vipul1992";
    
```

Figure 12: Code in Arduino

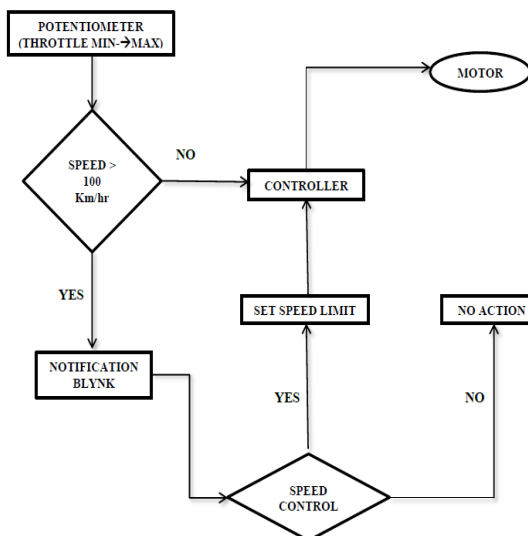


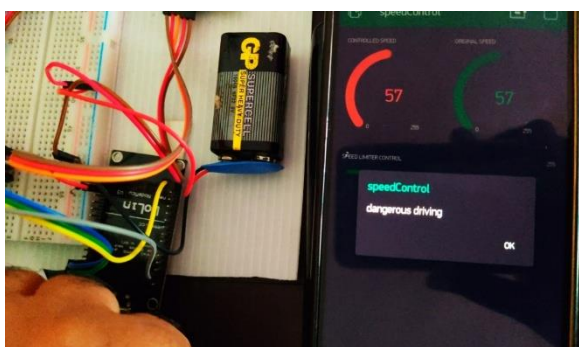
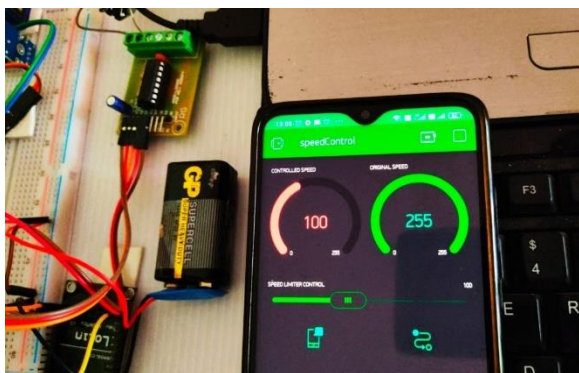
Figure 10: Flow chart of bike speed control system



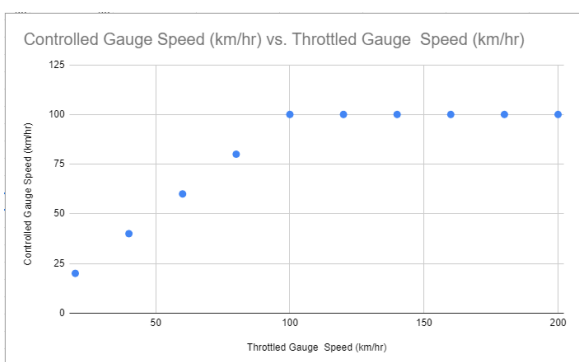
Figure 13: Working of Speed Control with slider control of blynk App

## 6. Results

By this project the parents can take care of their children if they exceed the specified speed limit by setting speed limit via blynk app on their mobile. This system will be more efficient to control the speed of two wheelers so that the accidents can be prevented. If the motor bike is moving with a speed more than the specified value then a message will arrived to parent's phone showing that vehicle is in dangerous driving. Once the upper limit is set then it is not possible to increase the speed of vehicle thereby parents can control the speed of vehicle and can avoid accidents.



**Figure 14:** Arrival of message & testing of motor bike speed control system using blynk app



**Table:** Relation between Throttled gauge speed and Controlled gauge speed if the speed is set to 100 Km/hr after receiving the message on Blynk App

## 7. Conclusion

IOT based motor bike speed control system using blynk app is the best solution for the parents that they can easily detect the speed of the vehicle of their children by utilizing internet of things so that it alerts the parents to control the vehicles speed by blynk app. The system accumulates information of

rash driving by displaying on blynk app by a message and if over speed occurs it alert the parent and they can control the speed by slider control. This designed detection system continuously monitors the speed of the vehicle. It minimizes the difficulties of traffic department and make ease to control the rash driving on roads. This project is presented a cost effective and reliable system for avoiding accidents.

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