**DRIVER DROWSINESS,DRUNKEN DRIVING DETECTION AND ALERTNESS SYSTEM USING IOT**

**ABSTRACT**

This system provides a unique method to drunken and drowsy people. This system has an alcohol sensor and eye blinking sensor embedded in the vehicles. Whenever the driver start vehicle, the sensors senses the eye blink and measures the content of alcohol in his breathe and automatically sends the signal to controller. In this system the outputs of sensors are given to the microcontroller for comparison. Drowsy is the reason for most of the road accidents. Manually tracing the drowsy driver is not an easy task, because every day thousands of vehicles are running on the roads. So we need a system that must come with every car and if it detects the sleepy driver it must stop the vehicle immediately. If the value reaches to fixed limit then automatically sends the intimation. The whole system is been monitored by using IOT.

**CHAPTER 1**

**INTRODUCTION**

Driver drowsiness detection is a car safety technology which helps prevent accidents caused by the driver getting drowsy. Various studies have suggested

that around 20% of all road accidents are fatigue-related, up to 50% on certain roads .Some of the current systems learn driver patterns and can detect when a driver is becoming drowsy .The development of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. Because of the hazard that drowsiness presents on the road, methods need to be developed for counteracting its affects The aim of this project is to develop a prototype drowsiness detection system. The focus will be placed on designing a system that will accurately monitor the eye blink rate, heart-beat respiration rate and temperature of the driver .In this project we use sensors to measure all these factors. The values measured will be sent to the microcontroller where the measured values will be compared with the reference values. If the values measured do not match with the reference values then the microcontroller will send a warning signal in the LCD display thereby preventing accidents.

This project involves measure and controls the eye blink & alcohol content using IR sensor & alcohol detector. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening position. Alcohol detector detects the content of alcohol in the breath and thus it attempts to clamp down alcoholics. This system uses microcontroller, LCD display, alcohol detector, GSM and buzzer. The output of the sensor is directly proportional to the content of alcohol consumed.

This output is given to logic circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink & alcohol detector. Here one eye blink sensor and alcohol detector is fixed in vehicle where if anybody loses conscious and indicate through alarm, LCD and GSM..The circuit has an alcohol sensor. This sensor measures the content of alcohol from the breath of drunken people. Output of the sensor is directly proportional to the alcohol content. When the alcohol molecules in the air meet the electrode that is between alumina and tin dioxide in the sensor, ethanol burns into acetic acid then more current is produced. So the more alcohol molecules more will be the current produced. Output of the sensor is then fed to the microcontroller for comparison.

The output of the sensors are in the analog nature which should be converted into digital format. This is done by the analog to digital converter of the microcontroller unit. The microcontroller controls the entire circuit.. The LCD displays the message, GSM sends message and buzzer produces alarm. The working conditions and various constraints were properly studied before carrying out further steps.

Driver Monitoring System, also known as Driver Attention Monitor, is a vehicle safety system first introduced by [Toyota](http://en.wikipedia.org/wiki/Toyota) in 2006 for its and [Lexus](http://en.wikipedia.org/wiki/Lexus) latest models. It was first offered on the GS 450h. The system's functions co-operate with the [Pre-Collision System (PCS)](http://en.wikipedia.org/wiki/Pre-Collision_System_%28PCS%29).The system uses infrared sensors to monitor driver attentiveness. Specifically, the Driver Monitoring System includes a [CCD](http://en.wikipedia.org/wiki/Charge-coupled_device) [camera](http://en.wikipedia.org/wiki/Camera) placed on the steering column which is capable of [eye tracking](http://en.wikipedia.org/wiki/Eye_tracking), via [infrared](http://en.wikipedia.org/wiki/Infrared) [LED](http://en.wikipedia.org/wiki/LED) detectors. If the driver is not paying attention to the road ahead and a dangerous situation is detected, the system will warn the driver by flashing lights, warning sounds. If no action is taken, the vehicle will apply the brakes (a warning alarm will sound followed by a brief automatic application of the IGNITION LOCKING system). This system is said to be the first of its kind. In 2008, the [Toyota Crown](http://en.wikipedia.org/wiki/Toyota_Crown) system went further and can detect if the driver is becoming sleepy by monitoring the eyelids

**1.2 LITERATURE SURVEY**

**[1] Design of Alcohol Detection System for Car Users thru Iris Recognition Pattern Using Wavelet Transform , Lea Angelica Navarro, Mark Anthony Diño, Exechiel Joson, Rommel Anacan, Roberto Dela Cruz Electronics Engineering Department, Technological Institute of the Philippines- Manila Manila, Philippines- [2016 7th International Conference on Intelligent Systems, Modelling and Simulation]**

The purpose of this paper is to develop a system that captures the Iris image of the driver by detecting if the person is drunk and likewise to develop a reliable algorithm for Iris Recognition. This paper is composed of hardware and software system which focuses on the implementation of an algorithm based on Gabor Filter. The system consists of CCD Camera and Analog-to-Digital Converter, which is linked into a MATLAB program to simulate the captured image which then provides a signal going to the microcontroller and a relay circuit to manipulate the car ignition. If the MATLAB program detects that the driver is under the influence of alcohol, a bypass system follows through a password which is recognized by the MATLAB program then the car/vehicle starts.

**[2] MUGILA.G, MUTHULAKSHMI.M, SANTHIYA.K, Prof.DHIVYA.P- SMART HELMET SYSTEM USING ALCOHOL DETECTION FOR VEHICLE PROTECTION[International Journal of Innovative Research in Science Engineering and Technology (IJIRTSE) ISSN: 2395-5619, Volume – 2, Issue – 7. July 2016]**

The purpose of this paper is to develop a system that captures the Iris image of the driver by detecting if the person is drunk and likewise to develop a reliable algorithm for Iris Recognition. This paper is composed of hardware and software system which focuses on the implementation of an algorithm based on Gabor Filter. The system consists of CCD Camera and Analog-to-Digital Converter, which is linked into a MATLAB program to simulate the captured image which then provides a signal going to the microcontroller and a relay circuit to manipulate the car ignition. If the MATLAB program detects that the driver is under the influence of alcohol, a bypass system follows through a password which is recognized by the MATLAB program then the car/vehicle starts.

**[3] Dhivya M and Kathiravan S, Dept. of ECE, Kalaignar Karunanidhi Institute of Technology- Driver Authentication and Accident Avoidance System for Vehicles [Smart Computing Review, vol. 5, no. 1, February 2015]**

The aim of our research paper is to represent our project which makes human driving safer and to overcome accidents. This project is developed by integrating alcohol sensor with Arduino board. Arduino processor OR NodeMCU handle more functions than conventional microcontrollers. The alcohol sensor used in this project is MQ3 which 10 detect the alcohol content in human breath. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden from the suspects. This project is fitted inside the vehicle. The project is designed for the safety of people sitting inside the vehicle.

**[4] Lee, Assessing the Feasibility of Vehicle-Based Sensors To Detect Alcohol Impairment. 2010, National Highway Traffic Safety Administration: Washington, DC**

Despite persistent efforts at the local, state, and federal levels, alcohol-impaired driving crashes still account for 31% of all traffic fatalities. The proportion of fatally injured drivers with blood alcohol concentrations (BAC) greater than or equal to 0.08% has remained at 31-32% for the past ten years. Vehicle-based countermeasures have the potential to address this problem and save thousands of lives each year. Many of these vehicle-based countermeasures depend on developing an algorithm that uses driver performance to assess impairment. The National Advanced Driving Simulator (NADS) was used to collect data needed to develop an algorithm for detecting alcohol impairment. Data collection involved 108 drivers from three age groups (21-34, 38-51, and 55-68 years of age) driving on three types of roadways (urban, freeway, and rural) at three levels of alcohol concentration (0.00%, 0.05%, and 0.10% BAC). The scenarios used for this data collection were selected so that they were both representative of alcohol-impaired driving and sensitive to alcohol impairment.

[5] **Alcohol Detection System in Vehicle Using Arduino**

**Pranjali Ingalepatil, Priyanka Barhate, Bhagyashri Nemade, Vijay D. Chaudhari,**  **June -2017**

The aim of our research paper is to represent our project which makes human driving safer and to overcome accidents. This project is developed by integrating alcohol sensor with Arduino board. Arduino processor ATmega328 is able to handle more functions than conventional microcontrollers. The alcohol sensor used in this project is MQ3 which to detect the alcohol content in human breath. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden from the suspects. This project is fitted inside the vehicle. The project is designed for the safety of people sitting inside the vehicle.

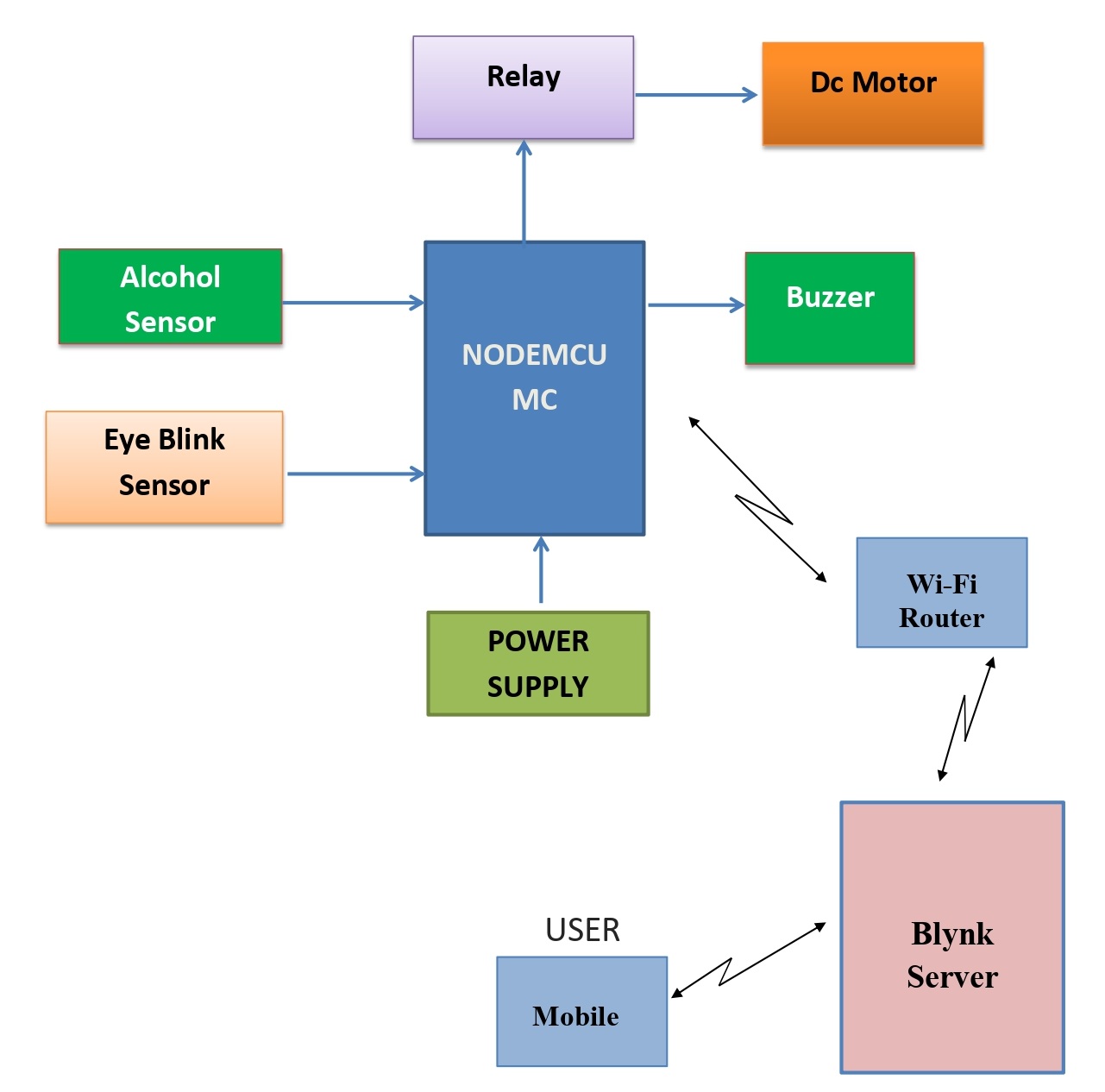
1.3 **PROBLEM STATEMENT**

Drunken driving is considered as one of the major reason of accidents in worldwide. Drivers under the influence of alcohol shows a clear failure of perception recognition and vehicle control. So, by this accident occurs

1.4 **METHODOLOGY**

The concept of drowsy driver detection system focuses on the functioning of all sensor modules used in the project. This helps explain the inputs received by modules and the outputs they produce.

**BLOCK DIAGRAM**



**CHAPTER 2**

**COMPONENTS AND DISCRIPATION**

The components are given below is:

1. ALCHOHOL SENSOR(MQ3)
2. ADAPTER
3. ESP 8266 Controller
4. EYE BLINK SENSOR
5. MOTOR DRIVER BOARD
6. RELAY
7. BUZZER
8. POWER SUPPLY BOARD

**ALCHOHOL SENSOR:**

This Alcohol sensor is air based, The Variation Across the eye will vary as per alcohol. If the eye is closed means the output is high otherwise output is low. This to know the eye is closing or opening positionThe analog gas sensor- MQ3 is suitable for alcohol detecting, this sensor can be used in a breath analyzer. It has a high sensitivity to alcohol and small sensitivity to benzene. The sensitivity can be adjusted by the potentiometer sensitive material of MQ3 gas sensor is SnO2, which with lower conductivity in clean air. When the target alcohol gas exist, the sensors conductivity is higher along with the gas concentration rising, use of simple electro circuit, convert change of conductivity to correspond output signal of gas concentration.



FIG 1 ALCHOL SENSOR

**Sensitivity Adjustment:**

Resistance value of MQ-3 is difference to various kinds and various concentration gases. So, when using these components, sensitivity adjustment is very necessary. It is recommended to calibrate the detector for 0.4mg/L (approximately 200ppm) of Alcohol concentration in air and use value of Load resistance that (RL) about 200 KΩ (100KΩ to 470 KΩ). When accurately measuring, proper alarm point for the gas detector has to be determined after considering the temperature and humidity influence

**Specification:**

1. Power supply requires 5 volts.

2. Interference type: analog only.

3. Pin specification: 1-output, 2-GND, 3-VCC

4. High sensitivity and fast response.

5. Stable and long life

6. Small towards benzene and High sensitivity to alcohol

Simple drive circuit with size: 40\*20mm

**EYE BLINKING SENSOR**

This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is fixed in vehicle where if anybody loses conscious and indicate through alarm, gsm and LCD. This project involves measure and controls the eye blink using IR sensor. The IR transmitter is used to transmit. The infrared rays in our eye. The IR receiver’s used to receive the

Reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening position. This output is given to logic circuit to indicate the alarm, gsm and LCD. This circuit is mainly used to for counting application, intruder detector etc

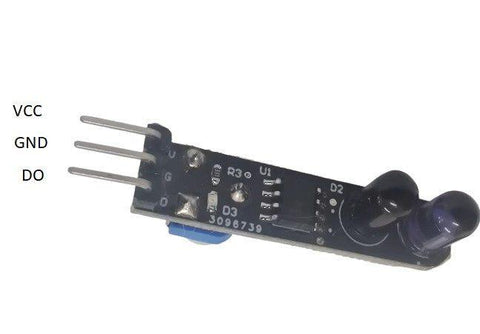


FIG 2 EYE BLINK SENSOR

**MOTOR DRIVER BOARD293D**

**PRODUCT DESCRIPTION:**

         The L293D motor driver is available for providing User with ease and user friendly interfacing for embedded application. L293D motor driver is mounted on a good quality, single sided non-PTH PCB.  The pins of L293D motor driver IC are connected to connectors for easy access to the driver IC’s pin functions. The L293D is a Dual Full Bridge driver that can drive up to 1Amp per bridge with supply voltage up to 24V. It can drive two DC motors, relays, solenoids, etc. The device is TTL compatible. Two H bridges of L293D can be connected in parallel to increase its current capacity to 2 Amp.

**Features:**

* Easily compatible with any of the system
* Easy interfacing through FRC (Flat Ribbon Cable)
* External Power supply pin for Motors supported
* Onboard PWM (Pulse Width Modulation) selection switch
* 2pin Terminal Block (Phoenix Connectors) for easy Motors Connection
* Onboard H-Bridge base Motor Driver IC (L293D)

**Technical Specification:**

* Power Supply : Over FRC connector 5V DC
* External Power 9V to 24V DC
* Dimensional Size : 44mm x 37mm x 14mm (l x b x h)
* Temperature Range : 0°C to +70 °C

**Electrical characteristics:**

* 600-mA Output Current Capability PerDriver
* Pulsed Current 1.2-A Per Driver
* Output Clamp Diodes for Inductive Transient Suppression
* Wide Supply Voltage Range 4.5 V to 36 V
* Separate Input-Logic Supply
* Thermal Shutdown
* Internal ESD Protection
* High-Noise-Immunity Inputs

1. **NodeMcu:** It is a CPU {Central Processing Unit} of the project, which is controlling all commands and play the required functions. NodeMcu is consists of USB port, Power supply adaptor connector, WiFi,16MHz Quartz crystal Processor and based on Mega 328. It contains 14 pins which can be use for input as well as for Output. It use 12C and SPI (Serial Peripheral Interface) Communication System for communicate/ commands.

2. **Jumper Wires:** Wires for connecting the components all together. Its made up of steel wire inside and insulating coating outside best for Arduino works and circuit board development.

3. **Radiation sensor:** A radiation detector is a device for measuring nuclear, electromagnetic or light radiation. A nuclear radiation detector identifies nuclear radiation by measuring the emission of ionizing radiation of alpha particles, beta particles and gamma rays. ... If radioactive radiation occurs, the inert gas is ionized.

4. **Buzzer:** A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

5. **LCD for indication:** A **16x2 LCD** means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

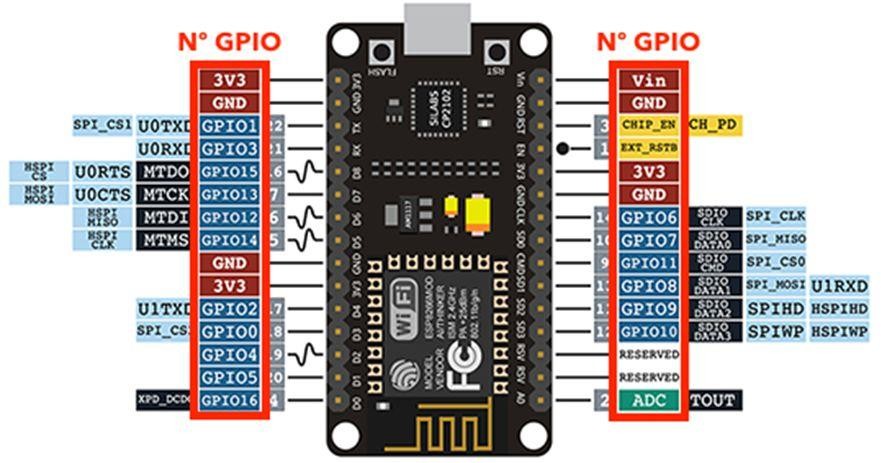
The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. Click to learn more about internal structure of a [LCD](http://www.engineersgarage.com/insight/how-lcd-works).

6. **Breadboard**: A breadboard is a solder less device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate.

7. **Resistor 220 ohm:** A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. Resistors act to reduce current flow, and, at the same time, act to lower voltage levels within circuits.

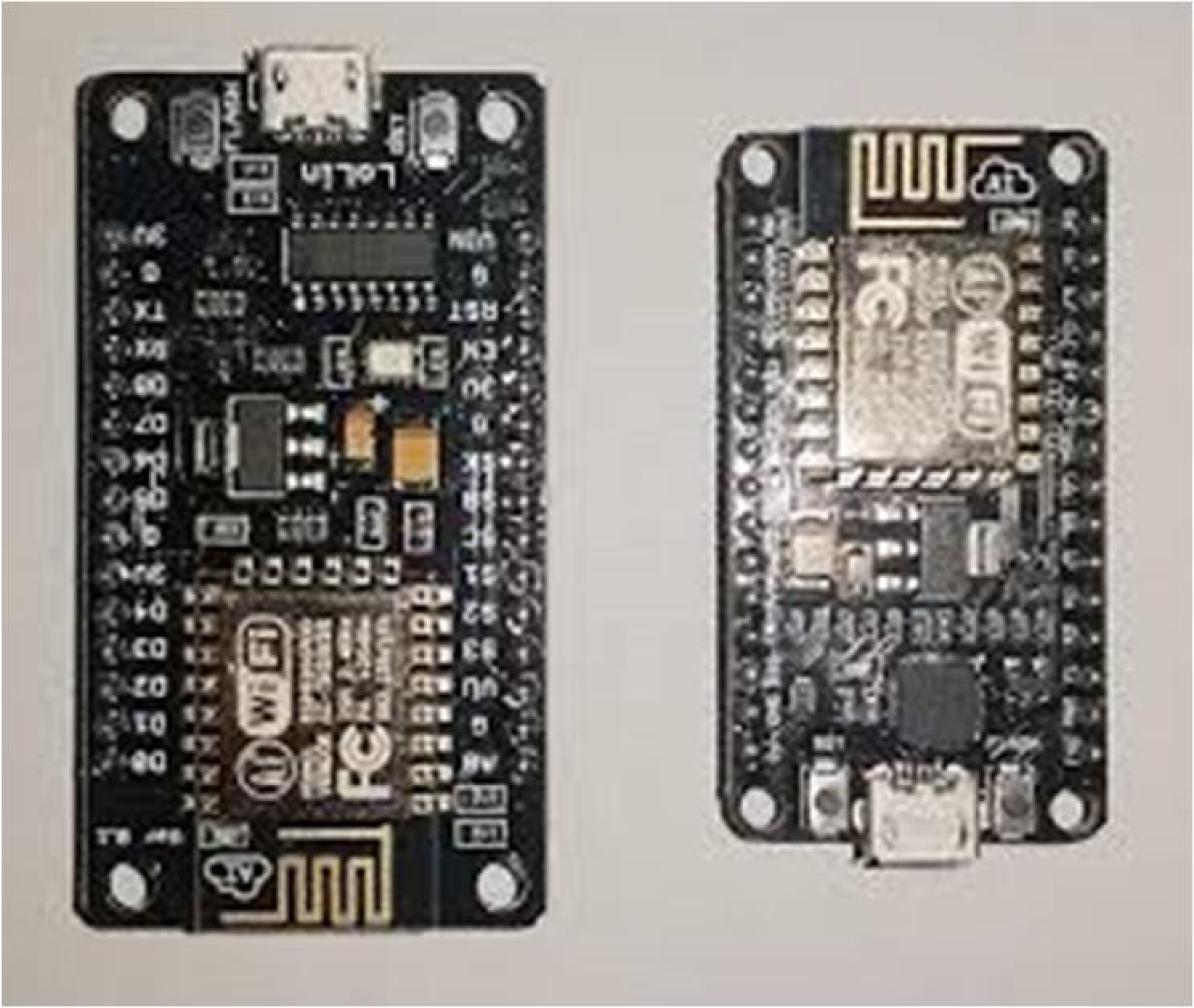
**2.3.5 Node MCU:**

**NodeMCU** is an open source IoT platform. It includes firmware which runs on the ESP8266Wi- Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits. The firmware uses the Lua scripting language. It is based on the eLua project, and built on the Espress-if Non- OS SDK for ESP8266. It uses many open source projects, such as lua-cjson, and spiffs.



## Figure 6: NodeMCU PINOUT

Node MCU provides a way to connect different sensors to their controllers wirelessly via wifi. Since, it is an improved version of the ESP8266 it has better and easier programming, with better voltage stability and more reliability.



## Figure 7: Node MCU

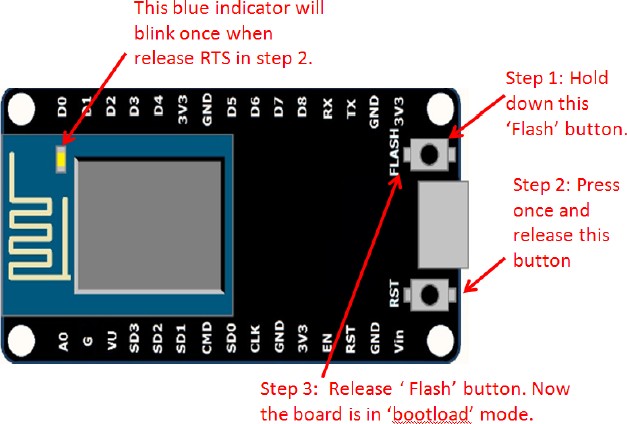
# Introduction NodeMCU V3

NodeMCU V3 is an open-source firmware and development kit that plays a vital role in designing an IoT product using a few script lines.

Multiple GPIO pins on the board allow us to connect the board with other peripherals and are capable of generating PWM, I2C, SPI, and UART serial communications.

* The interface of the module is mainly divided into two parts including both Firmware and Hardware where former runs on the ESP8266 Wi-Fi SoC and later is based on the ESP-12 module.

The firmware is based on Lua – A scripting language that is easy to learn, giving

a simple programming environment layered with a fast scripting language that connects you with a well-known developer community.

And open source firmware gives you the flexibility to edit, modify and rebuilt

the existing module and keep changing the entire interface until you succeed in optimizing the module as per your requirements.

* USB to UART converter is added on the module that helps in converting USB data to UART data which mainly understands the language of serial communication.

Instead of the regular USB port, MicroUSB port is included in the module that

connects it with the computer for dual purposes: programming and powering up the board.

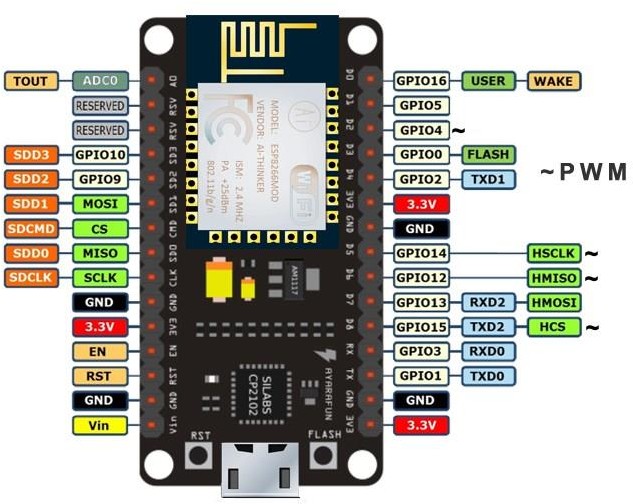
* The board incorporates status LED that blinks and turns off immediately, giving you the current status of the module if it is running properly when connected with the computer.

The ability of module to establish a flawless WiFi connection between two

channels makes it an ideal choice for incorporating it with other embedded devices like Raspberry Pi.

# NodeMCU V3 Pinout

NodeMCU V3 comes with a number of GPIO Pins. Following figure shows the Pinout of the board.



* There is a candid difference between Vin and VU where former is the regulated voltage that may stand somewhere between 7 to 12 V while later is the power voltage for USB that must be kept around 5 V.

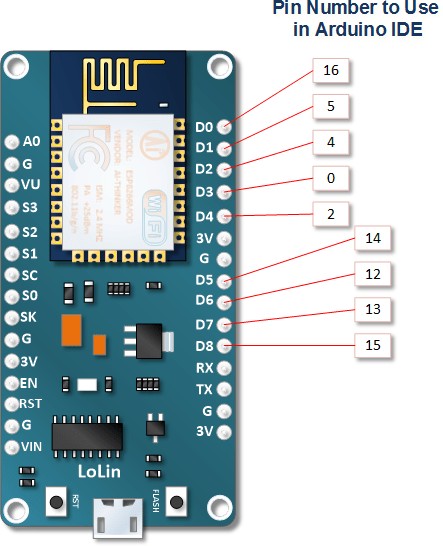
## Features

1. Open-source
2. Arduino-like hardware
3. Status LED
4. MicroUSB port
5. Reset/Flash buttons
6. Interactive and Programmable
7. Low cost
8. ESP8266 with inbuilt wifi
9. USB to UART converter
10. GPIO pins
11. Arduino-like hardware IO
12. Advanced API for hardware IO, which can dramatically reduce the redundant work for configuring and manipulating hardware.
13. Code like arduino, but interactively in Lua script.
14. Nodejs style network API
15. Event-driven API for network applicaitons, which faciliates developers writing code running on a 5mm\*5mm sized MCU in Nodejs style.
16. Greatly speed up your IOT application developing process.
17. Lowest cost WI-FI
18. Less than $2 WI-FI MCU ESP8266 integrated and esay to prototyping development kit.
19. We provide the best platform for IOT application development at the lowest cost.

As mentioned above, a cable supporting micro USB port is used to connect the board. As you connect the board with a computer, LED will flash. You may need some drivers to be installed on your computer if it fails to detect the NodeMCU board. You can download the driver from [this](https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers) page.

**Note:** We use [Arduino IDE](https://www.theengineeringprojects.com/2018/10/introduction-to-arduino-ide.html) software for programming this module. It is important to note that the pin configuration appearing on the board is different from the configuration we use to program the board on the software i.e. when we write code for targeting pin 16 on the Arduino IDE, it will actually help is laying out the communication with the D0 pin on the module.

Following figure the shows the pin configuration to use in Arduino IDE.



## How to Power NodeMCU V3

We can see from the pinout image above, there are five ground pins and three 3V3 pins on the board. The board can be powered up using the following three ways.

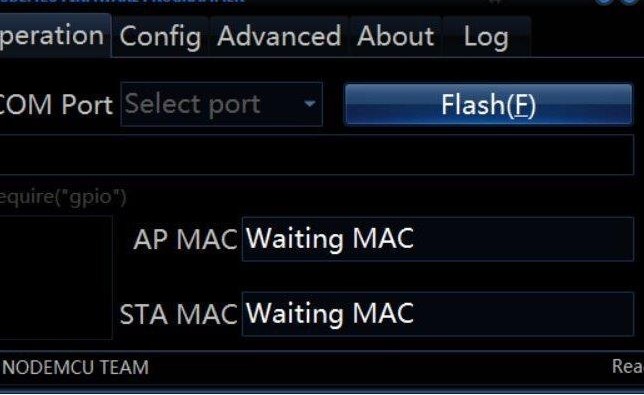
**USB Power.** It proves to an ideal choice for loading programs unless the project you aim to design requires separate interface i.e. disconnected from the computer.

**Provide 3.3V.** This is another great option to power up the module. If you have your own off-board regulator, you can generate an instant power source for your development kit.

**Power Vin.** This is a voltage regulator that comes with the ability to support up to 800 mA. It can handle somewhere between 7 to 12 V. You cannot power the devices operating at 3.3 V, as this regulator unable to generate as low as 3.3V.

## Programming

### Step 1: Installing the Firmware

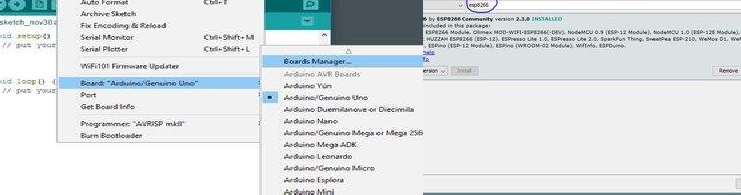


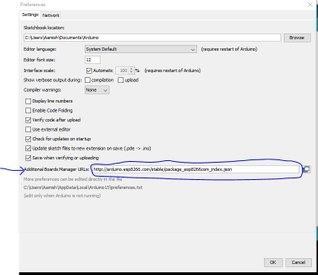
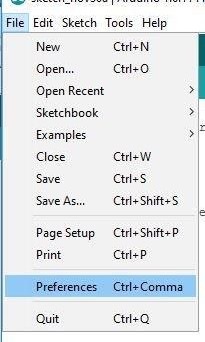
In NodeMCU Boards the first thing you need is to install the Firmware to the board the following method works for all NodeMCU Boards

1. Open the NodeMCU flasher master folder than open the win32/win64 folder as your computer. now open the folder Release than double click ESP8266Flasher.
2. Select the COM Port.
3. Goto config tab
4. click on the small gear and open up the firmware which you have downloaded
5. go to the advenced tab and select the desired Baudrate
6. Goto the Operation tab and click on Flash Button.

Add TipAsk QuestionCommentDownload

### Step 2: Preparing the Arduino IDE





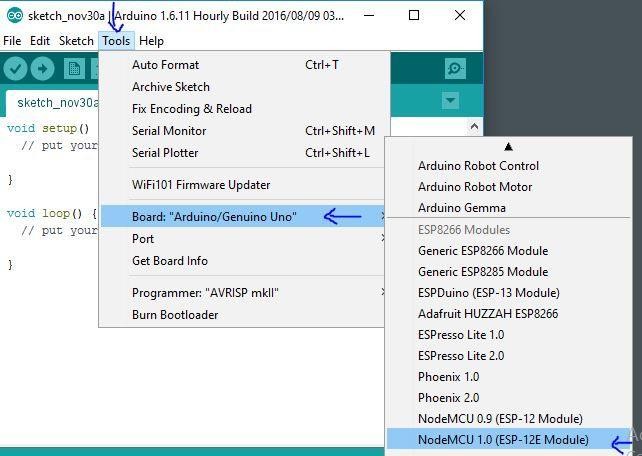
After Installing the firmware you are ready to do the programming with the ESP8266

1. Install the Arduino IDE
2. open the Arduino IDE from the desktop icon
3. Click on File tab and than open preferences
4. In the additional Boards Manager URLs add the following link [(htt](http://arduino.esp8266.com/stable/package_esp8266com_index.json))p[://arduino.esp8266.com/stable/package\_esp8266com\_index.json)](http://arduino.esp8266.com/stable/package_esp8266com_index.json)) and click OK
5. Goto Tools>Borads>Boards Manager
6. In the search field type esp8266 click the esp8266 by ESP8266 Community option and click Install

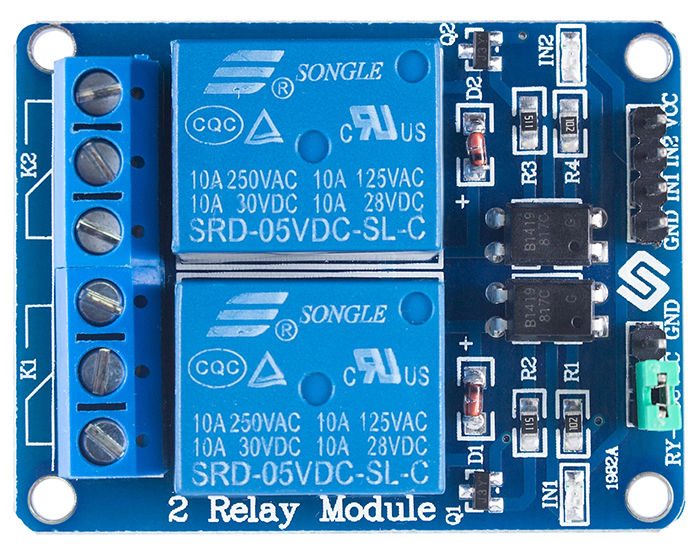
### Step 3: Code...

Now we can do whatever you want with your NodeMCU board Following is an example for led blinking with NodeMCU board via webserver

* In arduino IDE goto tools>Boards>select NODEMCU 1.0 (ESP - 12E Module)
* again goto tools and select port.
* Change the Wifi name and password from the following code.
* Now click on Upload button to upload the following code.
* Connect the led's positive leg on D9 pin of board and negative to the ground of the code.
* Power up the board and open the serial monitor from arduino IDE
* after connecting to the wifi it will show you the IP address.
* type that IP address on the web browser(Edge, Chrome, Firefox etc..)
* A webpage will open you can change the status of LED by turning it ON or OFF.



**Introduction**

[](http://wiki.sunfounder.cc/index.php?title=File:2cha1.jpg)

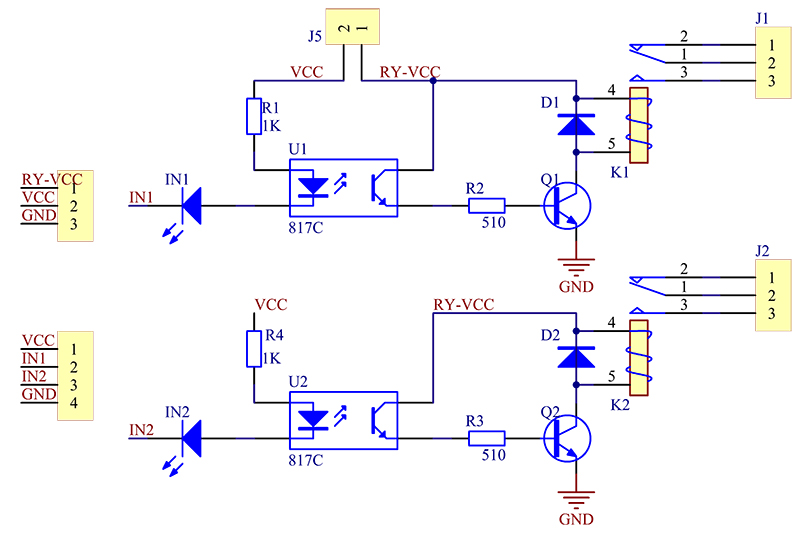
This is a LOW Level 5V 2-channel relay interface board, and each channel needs a 15-20mA driver current. It can be used to control various appliances and equipment with large current. It is equipped with high-current relays that work under AC250V 10A or DC30V 10A. It has a standard interface that can be controlled directly by microcontroller.

**Features**

* Relay Maximum output: DC 30V/10A, AC 250V/10A
* 2 Channel Relay Module with Opt coupler LOW Level Trigger expansion board, which is compatible with arduino
* Standard interface that can be controlled directly by microcontroller ( 8051, AVR, \*PIC, DSP, ARM, ARM, MSP430, TTL logic)
* Relay of high quality loose music relays SPDT. A common terminal, a normally open, one normally closed terminal
* opt coupler isolation, good anti-jamming

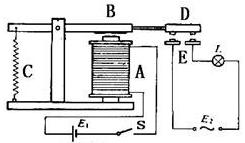
**Schematic**

VCC and RY-VCC are also the power supply of the relay module. When you need to drive a large power load, you can take the jumper cap off and connect an extra power to RY-VCC to supply the relay; connect VCC to 5V of the MCU board to supply input signals.

[](http://wiki.sunfounder.cc/index.php?title=File:2cha2.jpg)

**Principle**

See the picture below: A is an electromagnet, B armature, C spring, D moving contact, and E fixed contacts. There are two fixed contacts, a normally closed one and a normally open one. When the coil is not energized, the normally open contact is the one that is off, while the normally closed one is the other that is on.

[](http://wiki.sunfounder.cc/index.php?title=File:2cha3.jpg)

Add a certain voltage to the coil and some currents will pass through the coil thus generating the electromagnetic effect. So the armature overcomes the tension of the spring and is attracted to the core, thus closing the moving contact of the armature and the normally open contact (or you may say releasing the former and the normally closed contact). After the coil is de-energized, the electromagnetic force disappears and the armature moves back to the original position, releasing the moving contact and normally closed contact. The closing and releasing of the contacts results in power on and off of the circuit.

**Input:**

VCC : Connected to positive supply voltage (supply power according to relay voltage)  
GND : Connected to negative supply voltage  
IN1: Signal triggering terminal 1 of relay module  
IN2: Signal triggering terminal 2 of relay module

**Output:**

Each submodular of the relay has one NC (nomalclose), one NO (nomalopen) and one COM (Common). So there are 2 NC, 2 NO and 2 COM of the channel relay in total. NC stands for the normal close port contact and the state without power; No stands for the normal open port contact and the state with power. COM means the common port. You can choose NC port or NO port according to whether power or not.

**Application**

General purpose

**DESCRIPTION**

This Relay Module 2-Channel is a module designed to allow you to control two relays in a very simple and intuitive manner. Being compatible with Arduino, the most immediate way to use it is to connect it to an Arduino board using flexible jumpers.

Exploiting the characteristics of the relays mounted on the module and through the use of two Arduino digital I/O pins, it is possible to control motors, inductive loads and other devices; this product is therefore fundamental in domotics projects or, more in general, in robotics projects.

The module is equipped with two optocouplers on the IN1 and IN2 lines in such a way that it ensures the galvanic insulation between the relay load and the control board which drives this module. Two LEDs indicate the ON and OFF state of the two channels.

**CHARACTERISTICS**

|  |  |
| --- | --- |
| Supply voltage | +5V |
| Supply current | 144mA typ. (150mA max.) |
| Current on pin INx | 14mA typ. |
| Rated load | 7A 250VAC |
| Operating temperature | -30°C / +70°C |
| Operate time max. | 10ms Max. |
| Release time max. | 5ms Max. |
| Insulation resistance | 100Mohm Min. |
| Mechanical Life Expectancy | 10,000,000 operations |
| Electrical Life Expectancy | 10,000 operations |
| Dimensions | 1.7” x 1.3” (43.2 x 33.0 mm) |
| Weight | 0.92 oz (26.2g) |

**2-Channel 5V Relay Shield Module** is a 5V 2-channel relay interface board; it can be controlled directly by a wide range of microcontrollers such as Arduino, AVR, PIC, ARM and so on. With digital outputs to control larger loads and devices like AC or DC Motors, electromagnets, solenoids, and incandescent light bulbs. This module is designed to be integrated with 2 relays that it is capable of control 2 relays. The relay shield use high-quality relay with rated load 7A/240VAC,10A/125VAC,10A/28VDC.The relay output state is individually indicated by a light-emitting diode.

**Features of 2-Channel 5V Relay Shield Module:**

* Brand new and high quality.
* This module can be used with Arduino Special Sensor Shield V4.0.
* 2-Channel Relay interface board,
* Each one needs 15-20mA Driver Current
* Equiped with high-current relay : DC30V 10A AC250V 10A
* Standard interface that can be controlled directly by microcontroller (Arduino , 8051, AVR, PIC, DSP, ARM)

**Package Includes:**

* 1 x 2-Channel 5V Relay Module

Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Types

**Electromechanical**

Early devices were based on an electromechanical system identical to an [electric bell](https://en.wikipedia.org/wiki/Electric_bell) without the metal gong. Similarly, a relay may be connected to interrupt its own actuating [current](https://en.wikipedia.org/wiki/Electric_current), causing the [contacts](https://en.wikipedia.org/wiki/Switch) to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

**Mechanical**

A [joy buzzer](https://en.wikipedia.org/wiki/Joy_buzzer) is an example of a purely mechanical buzzer and they require drivers. Other examples of them are doorbells.

**Piezoelectric**



FIG 4: BUZZER

A [piezoelectric](https://en.wikipedia.org/wiki/Piezoelectric) element may be driven by an [oscillating](https://en.wikipedia.org/wiki/Oscillation) electronic circuit or other [audio signal](https://en.wikipedia.org/wiki/Audio_signal) source, driven with a [piezoelectric audio amplifier](https://en.wikipedia.org/wiki/Piezoelectric_audio_amplifier). Sounds commonly used to indicate that a button has been pressed are a click, a ring or a beep.

**Features:**

1. The PS series are high performance buzzers that employ uni-morph piezoelectric elements and are designed for easy incorporation into various circuits.

2. They feature extremely low power consumption in comparison to electromagnetic units.

3. Because these buzzers are designed for external excitation, the same part can serve as both a musical tone oscillator and a buzzer.

4. They can be use with automated inserters; moisture- resistant models are also available

APPLICATION

This device provides much advanced facilities in now a day’s life as it can be easily implemented in vehicles. This device provides safety for government transports. It is useful for tour & travel agency. It can also be used in schools, colleges, offices and some public places taking attention of drunken persons. Military application where high intensity monitoring of soldier is needed.

**SOFTWARE DESCRIPTION**

# ARDUINOIDE:

# Introduction

The open-source Arduino Software (IDE) is used to ease the process of writing code and upload it to any developmental board compatible with this software. It can run on Windows, Mac OS X, and Linux. The Integrated Development Environment is written in Java and the execution is based on Processing projects. It contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the developmental board hardware in order to upload programs and communicate with them.

# Scripting

The programs that are written in the IDE are generally referred to as sketches; they are written in the text editor region provided in the IDE; like any text editor they support all the common and basic functionalities. The scripts are generally saved with an extension of “.ino”. The IDE provides provision for compiling and verifying the code before uploading the code to the hardware of the board that is used. Sketchbook is the concept used by the Arduino IDE. It is a standard place wherein the user can review his most recent scripts and access the same.

# Uploading

While uploading the code to the hardware it is mandatory to ensure that proper port is selected and baud rate is accepted by the hardware. The data is generally transmitted in a serial fashion. There is a provision for visualizing the transferring

and displaying the data given to the hardware by using Serial Monitor. Depending

on the board’s hardware proper baud rate must be selected.

# Language

Most of the boards are supported by the arduio IDE owing to the inputs from the vast community. Each board has its own specific sets of libraries that can be downloaded directly from the IDE. The language that is used in programming the IDE is normal C/C++. Most of the standard C/C++ libraries will function in the IDE with exception of a few; this depends on the hardware specifications of the board connected and the RAM capability.

The NodeMCU can be programmed using the Arduino IDE by downloading a specific set of libraries for the same. The baud rate and the port specification of the IDE is changed in accordance with the hardware specification of NodeMCU and program is uploaded in a serial fashion into the board. The program is written in standard C/C++ language along with the library supporting MQTT functionality.

All the standard MQTT protocol methods are supported on NodeMCU.

# NodeMCU Code via ArduinoIDE

TocodeNodeMCUviaArduinoIDE,theNodeMCUneedstobeaddedtoArduinoIDElibrary first by adding this address to Arduino IDE preferences. After this reference is added to Arduino IDE, download nodeMCU to boards manager and then select NodeMCU 1.0 (ESP- 12EModule).AfternodeMCUisaddedtoArduinoIDElibrary,uploadthiscodewithchanging hotspot name and password also token code. Shown in figure6.

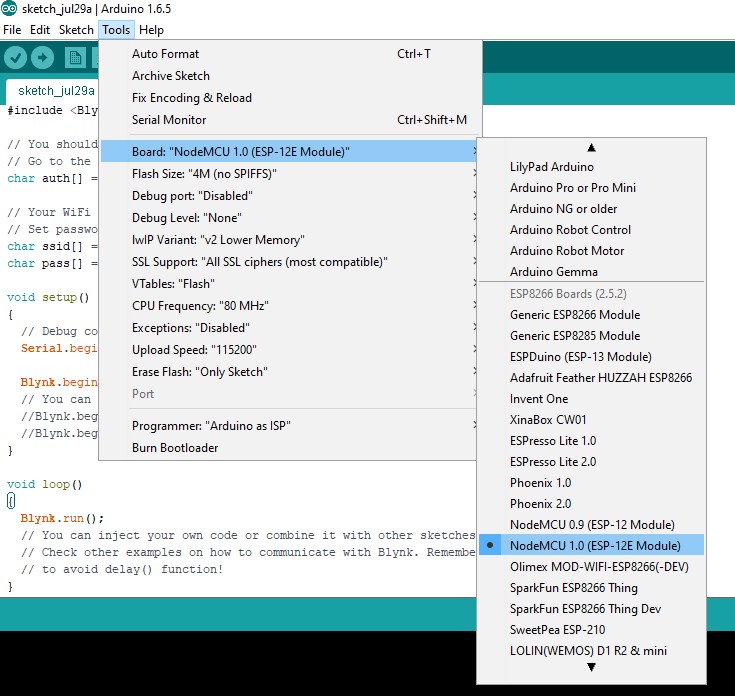


Figure 6. Setting up NodeMCU in Arduino IDE

Figure 7 shows the NodeMCU code. The code includes the hotspot name and password match with the android. The code does not need to identify the relay input, as it is included in[Blynk.run();]. When auth (autho token) is given by Blynk application sent as email and SSID is the name of smart phone hotspot.

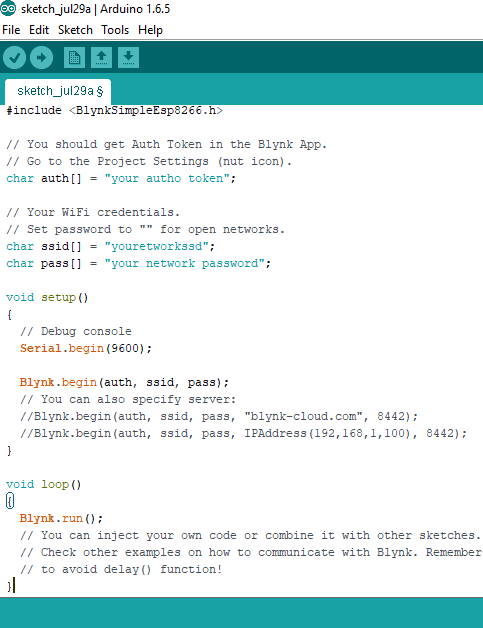


Figure 7. NodeMCU Code

**BLYNK APP**

Blynk is a new platform that allows you to quickly build interfaces for controlling and monitoring your hardware projects from your iOS and Android device. After downloading the Blynk app, you can create a project dashboard and arrange buttons, sliders, graphs, and other widgets onto the screen. Using the widgets, you can turn pins on and off or display data from sensors.Whatever your project is, there are likely hundreds of tutorials that make the hardware part pretty easy, but building the software interface is still difficult. With Blynk, though, the software side is even easier than the hardware

## How Blynk Works

Blynk was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, vizualize it and do many other cool things.

There are three major components in the platform:

* **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 smartphone and hardware. You can use our Blynk Cloud or run your [private Blynk server](https://docs.blynk.cc/#blynk-server) locally. It’s open-source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.
* **Blynk Libraries** - for all the popular hardware platforms - enable communication with the server and process all the incoming and outcoming commands.

Now imagine: every time you press a Button in the Blynk app, the message travels to the Blynk Cloud, where it magically finds its way to your hardware. It works the same in the opposite direction and everything happens in a blynk of an eye.

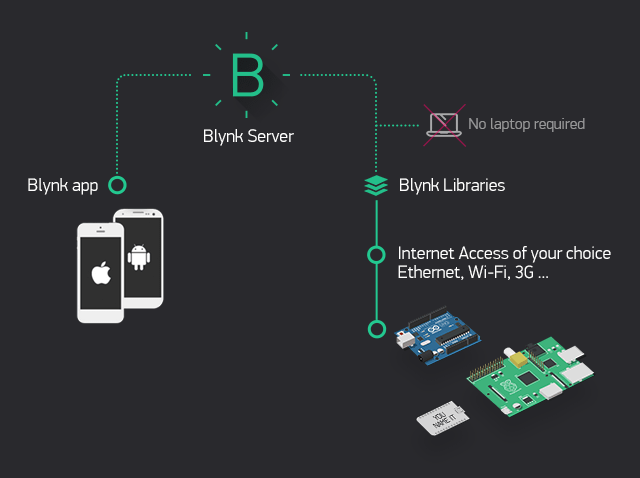


Figure 1. Blynk System Principle

## Features

* Similar API & UI for all supported hardware & devices
* Connection to the cloud using:
  + WiFi
  + Bluetooth and BLE
  + Ethernet
  + USB (Serial)
  + GSM
  + …
* Set of easy-to-use Widgets
* Direct pin manipulation with no code writing
* Easy to integrate and add new functionality using virtual pins
* History data monitoring via SuperChart widget
* Device-to-Device communication using Bridge Widget
* Sending emails, tweets, push notifications, etc.
* … new features are constantly added!

#### **1. Hardware**.

An Arduino, Raspberry Pi, or a similar development kit.

**Blynk works over the Internet.**

This means that the hardware you choose should be able to connect to the internet. Some of the boards, like Arduino Uno will need an Ethernet or Wi-Fi Shield to communicate, others are already Internet-enabled: like the ESP8266, Raspberri Pi with WiFi dongle, Particle Photon or SparkFunBlynk Board. But even if you don’t have a shield, you can connect it over USB to your laptop or desktop (it’s a bit more complicated for newbies, but we got you covered). What’s cool, is that the [list of hardware](https://docs.blynk.cc/#supported-hardware) that works with Blynk is huge and will keep on growing.

#### **2. A Smartphone**.

The Blynk App is a well designed interface builder. It works on both iOS and Android

The system is based on NodeMCU board as an internet of things system. The NodeMCU is connected to the internet from the hotspot of the smart phone via WIFI connection as the NodeMCU has ESP8266 circuit to connect with the internet.

NodeMCU to be connected to the hotspot of the smart phone, needs to be identified to the name of hotspot, the password and token code letting the server of Blynk connects them together. You may need the computer once to transfer code from Arduino IDE to the NodeMCU kit to prepare the software part of the project. Figure 1 shows that the server of Blynk application will process the smartphone-NodeMCU connection. Blynk libraries are ZIP files can be downloaded from Github website to be imported to the Arduino IDE library.

Blynk server will check for internet connection, NodeMCU with android hotspot, the NodeMCU code includes the token code, the name of hotspot and it’s password. The informationincludedtothecodemustbematchwiththehotspotinformationtoallowESP8266 connect with the WIFI to be as a channel to exchange commands between smart phone and NodeMCU. Remaining processes are just commands sent from Blynk application to NodeMCU to control loads those are connected to the relay kit as shown in Figure 2. And sensor output value is sent reverse to the Blynk application from NodeMCUkit.

### PROJECT BUILDING PROCEDURE

### 1. Create a Blynk Account

After you download the Blynk App, you’ll need to create a New Blynk account. This account is separate from the accounts used for the Blynk Forums, in case you already have one.

We recommend using a **real** email address because it will simplify things later.

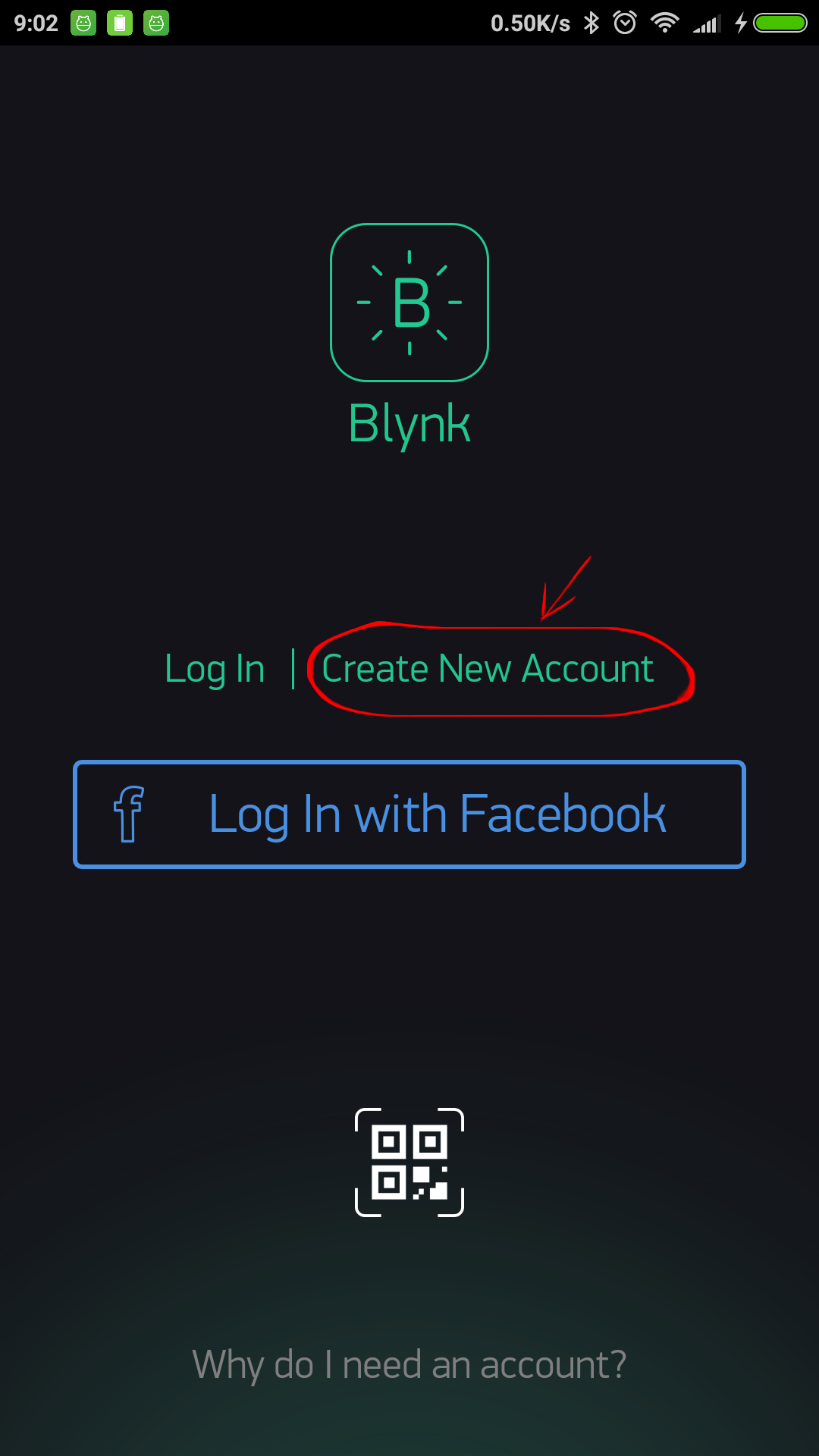
#### Why do I need to create an account?

An account is needed to save your projects and have access to them from multiple devices from anywhere. It’s also a security measure.

You can always set up your own [Private Blynk Server](https://docs.blynk.cc/#blynk-server) and have full control.

### 2. Create a New Project

After you’ve successfully logged into your account, start by creating a new project.

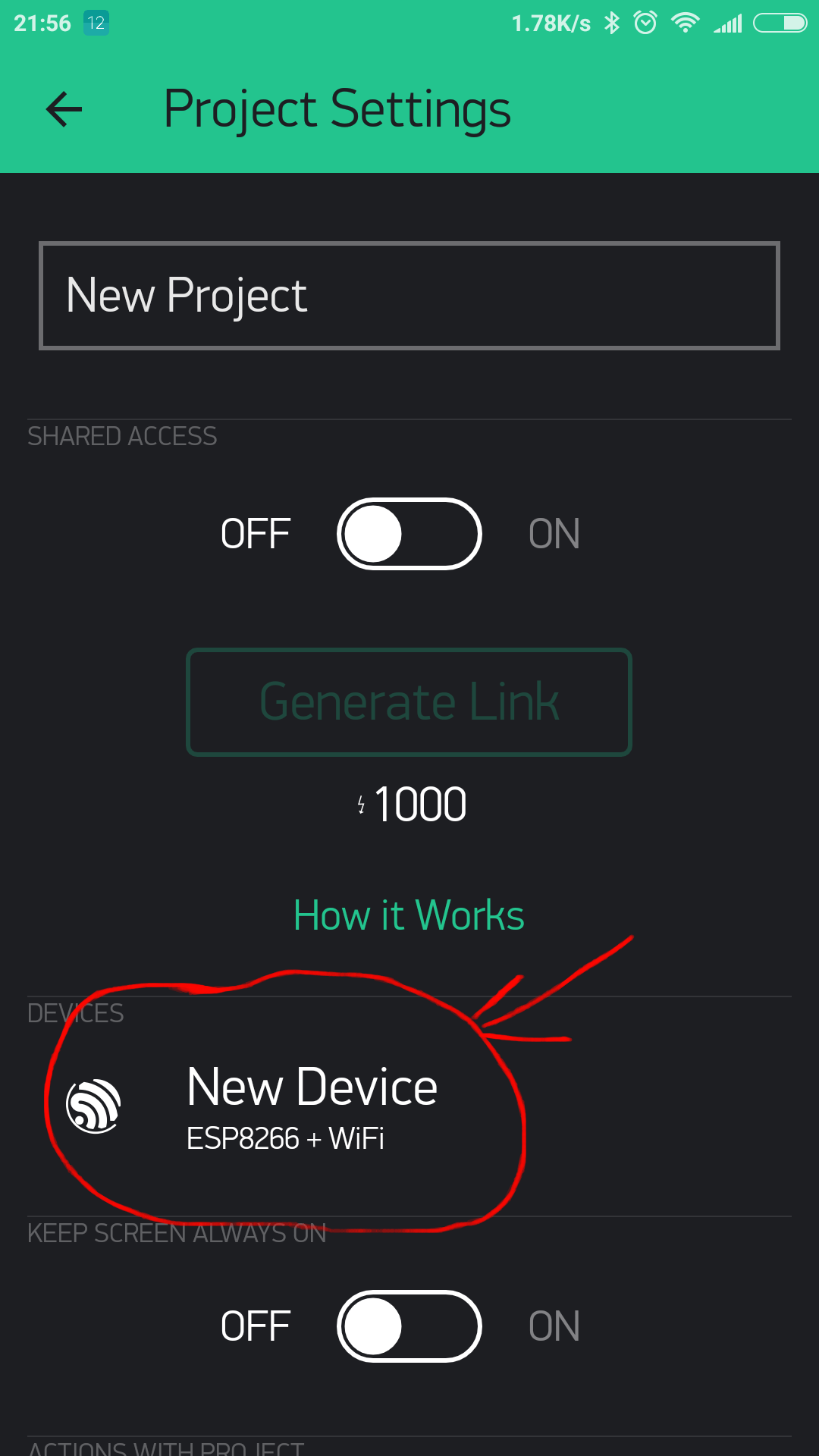


### 3. Choose Your Hardware

Select the hardware model you will use. Check out the [list of supported hardware](https://docs.blynk.cc/#supported-hardware)!

### 4. Auth Token

**Auth Token** is a unique identifier which is needed to connect your hardware to your smartphone. Every new project you create will have its own Auth Token. You’ll get Auth Token automatically on your email after project creation. You can also copy it manually. Click on devices section and selected required device :



And you’ll see token :

**NOTE:** Don’t share your Auth Token with anyone, unless you want someone to have access to your hardware.

It’s very convenient to send it over e-mail. Press the e-mail button and the token will be sent to the e-mail address you used for registration. You can also tap on the Token line and it will be copied to the clipboard.

Now press the **“Create”** button.

### 5. Add a Widget

Your project canvas is empty, let’s add a button to control our LED.

Tap anywhere on the canvas to open the widget box. All the available widgets are located here. Now pick a button.

**Widget Box**

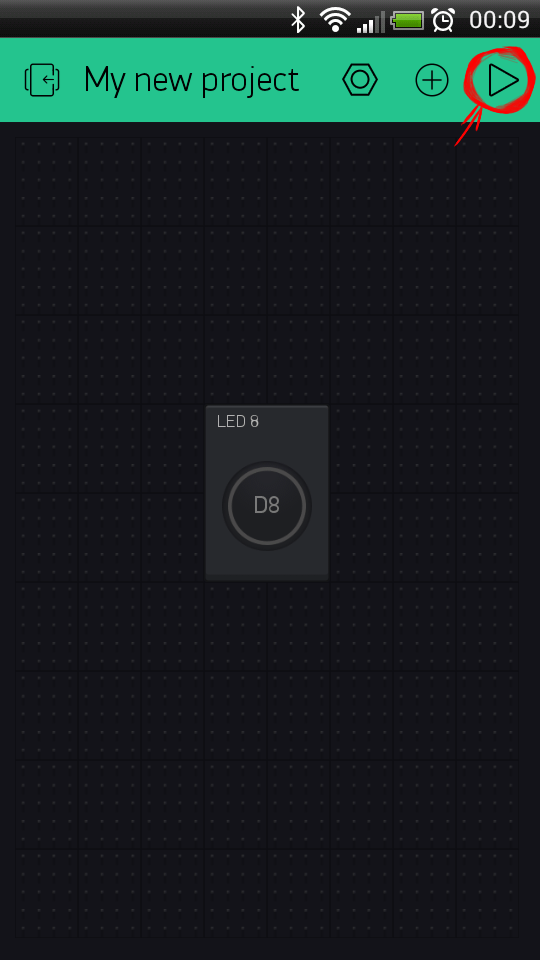
**Drag-n-Drop** - Tap and hold the Widget to drag it to the new position.

**Widget Settings** - Each Widget has it’s own settings. Tap on the widget to get to them.

The most important parameter to set is **PIN** . The list of pins reflects physical pins defined by your hardware. If your LED is connected to Digital Pin 8 - then select **D8** (**D** - stands for **D**igital).

**6. Run The Project**

When you are done with the Settings - press the **PLAY** button. This will switch you from EDIT mode to PLAY mode where you can interact with the hardware. While in PLAY mode, you won’t be able to drag or set up new widgets, press **STOP** and get back to EDIT mode.



You will get a message saying “Arduino UNO is offline”. We’ll deal with that in the next section.

Code

#include <SPI.h>

#include <Ethernet.h>

#include <BlynkSimpleEthernet.h>

charauth[] = "YourAuthToken"; // Put your token here

BlynkTimer timer; // Create a Timer object called "timer"!

void setup()

{

Serial.begin(9600);

Blynk.begin(auth);

timer.setInterval(1000L, sendUptime); // Here you set interval (1sec) and which function to call

}

voidsendUptime()

{

// This function sends Arduino up time every 1 second to Virtual Pin (V5)

// In the app, Widget's reading frequency should be set to PUSH

// You can send anything with any interval using this construction

// Don't send more that 10 values per second

Blynk.virtualWrite(V5, millis() / 1000);

}

void loop()

{

Blynk.run(); // all the Blynk magic happens here

timer.run(); // BlynkTimer is working...

}

**CONCLUSION**

Our project Accident Prevention by Eye Blinking Sensor and Alcohol Detector was implemented successfully. This device provides much advanced facilities in now a day’s life as it can be easily implemented in vehicles. Thus we can reduce alcohol and drowsy related road accidents and hence these kinds of detectors have a great relevance. It can also be used in schools, colleges, offices and some public places such as hospitals, libraries etc.Through this project we present hardware programming of microcontroller to facilitate as alcohol sensor, eye blinking sensor.

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