International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 05 | May - 2023 SJIF 2023: 8.176 ISSN: 2582-3930

# Keyless Ignition system for Vehicle Using WI-FI Module

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**ABSTRACT:**
The theft problem which may be available in existing vehicles due to key based ignition systems may lead to financial loss of the customers. Our developed wireless node MCU controller can reduce this problem. The paper proposes a novel keyless vehicle ignition system to replace the traditional wired technology and enhances vehicle security. A keyless ignition system using a Wi-Fi module is a unique way to integrate wireless technology into a vehicle's ignition system. This system uses a Wi-Fi module to communicate with the vehicle's computer and allow for remote starting and stopping of the engine. The software is written using embedded C which is then compiled and loaded into the Node-MCU controller. The advantages of this system are users being able to ignite their vehicle engine at any time and from anywhere after authentication. Also, digital QR code generation technique available with the vehicle owner can facilitate the use of the vehicle by any individual.
KEYWORDS: Keyless entry, Wifi module, Blynk app, microcontroller, relay module, remote start, internet connectivity, wireless communication, automotive security, ignition system.

**INTRODUCTION:**
A keyless ignition system is a type of vehicle starting system that allows the driver to start the car without using a traditional key. Instead, a wireless device, such as a key fob or smartphone, is used to communicate with the vehicle's computer and start the engine. A keyless ignition system, also known as a "smart key" or "push-button start," is a unique feature that allows a driver to start a vehicle without the use of a traditional metal key. Instead, the system uses a wireless key fob that communicates with the vehicle's computer to unlock the doors, start the engine, and perform other functions. The key fob typically contains a small electronic chip that sends a signal to the car's computer when it is within range. Once the signal is received, the driver can start the engine by pressing a button on the dashboard or center console. Some systems also allow for remote starting from a distance, which can be especially convenient in extreme weather conditions.
One of the major benefits of a keyless ignition system is convenience. It eliminates the need to fumble with keys, which can be especially helpful when carrying groceries or other items. Additionally, it can enhance vehicle security by making it more difficult for thieves to steal the car since they would need the key fob in order to start the engine. there are also adverse drawbacks to be consider. Keyless ignition systems can be more 'expensive' to repair or replace if they malfunction and they may also be 'vulnerable' to hacking or other forms of cybercrime. Additionally, some drivers may prefer the tactile feedback of turning a physical key in the ignition rather than simply pressing a button.

**NODE MCU:**

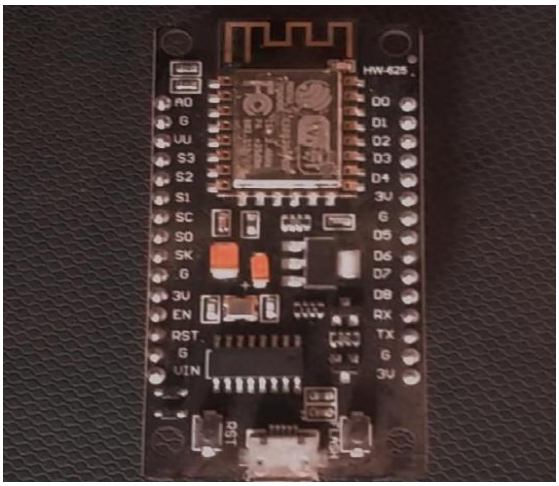

**Figure 1 Node MCU**

The Node-MCU Wi-Fi module shown in figure 1 is a compact and low-cost development board that integrates an ESP8266 Wi-Fi chip with a USB-to-serial interface. This feature makes it easy to

connect to a computer for programming. It's features are 32-bit microcontroller, 4MB flash memory, and support for the Lua scripting language, enabling it to be used for a variety of Internet of Things (IoT) applications.

**Specifications Of Node MCU (ESP8266) are:**

- Developer: ESP8266 Open-source Community.
- 2 Type: Single board microcontroller
- Operating system: XTOS
- CPU: ESP8266
- Memory: 128kBytes
- Storage: 4MBytes
- Power By: USB
- Power Voltage: 3v ,5v

**RELAY MODULE:**

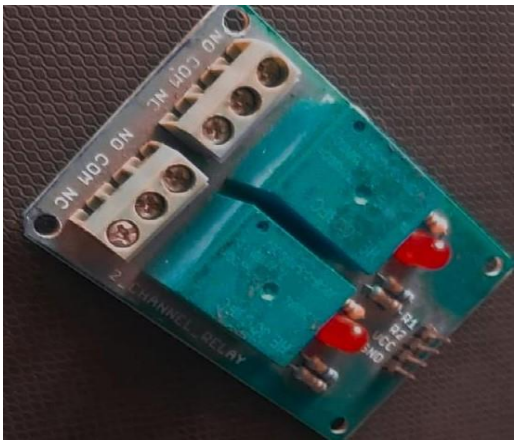

**Figure 2 Relay Module**

A 2-channel relay module is an electronic device that is designed to control electrical circuits or devices using two independent channels. Each channel is composed of a re A 2 channel relay module is an electronic device that is designed to control electrical circuits or devices using two independent channels. Each channel is composed of a relay switch and associated circuitry, and is capable of controlling an electrical load of up to a specific current and voltage rating.

Relays are essentially switches that can be remotely controlled by an electrical signal. They consist of an electromagnetic coil and a set of contacts that are switched on or off when the coil is energize A 2 channel relay module is an electronic device that is designed to control electrical circuits or devices using two independent channels. Each channel is composed of a relay switch and associated circuitry, and is capable of controlling an electrical load of up to a specific current and voltage rating.

These types of relay modules are commonly used in home automation, robotics, and other electronic projects where multiple devices need to be controlled independently. They are easy to use and interface with microcontrollers, and can be used to switch AC or DC loads such as lights, motors, or solenoids.

- **Specifications:**
  1. Relay interfacing board each one needs 15-20mA Driver Current.
  2. Both can be controlled by 12V and 5V input Voltage.
  3. Equipped with
  4. high-current relay,AC250V10AC30V 10A.
  5. Standard interfacing that can be controlled directly through microcontroller.
  6. Opto-isolated inputs • Indication LED's for Relay output status.

**BLOCK DIAGRAM:**

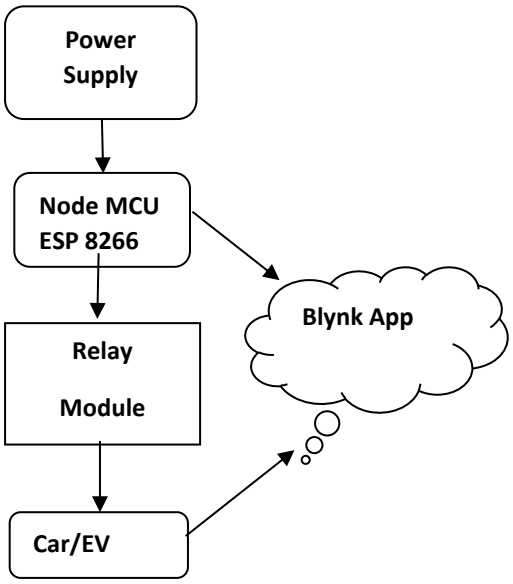


**Figure 3 Block Diagram of Proposed System**

Components: A Node-MCU, a WiFi module, a relay module, and the Blynk app.

1. Wiring: The Node-MCU is connected to the WiFi module, the relay module, and the ignition switch. The relay module is connected to the car's starter motor.
2. Blynk app setup: The Blynk app is set up with a button widget that sends a signal to the microcontroller when pressed.
3. Node-MCU programming: The Node-MCU is programmed to receive a signal from the Blynk app when the button widget is pressed. When the signal is received, the Node-MCU sends a signal to the relay module to activate the starter motor and start the engine.
4. User interaction: The driver opens the Blynk app on their smartphone and presses the button widget to start the car. No physical key is required.
5. WiFi connectivity: The WiFi module connects the Node-MCU to the Blynk cloud, allowing the app to communicate with the car's ignition system from anywhere with an internet connection.

**CIRCUIT DIAGRAM:**

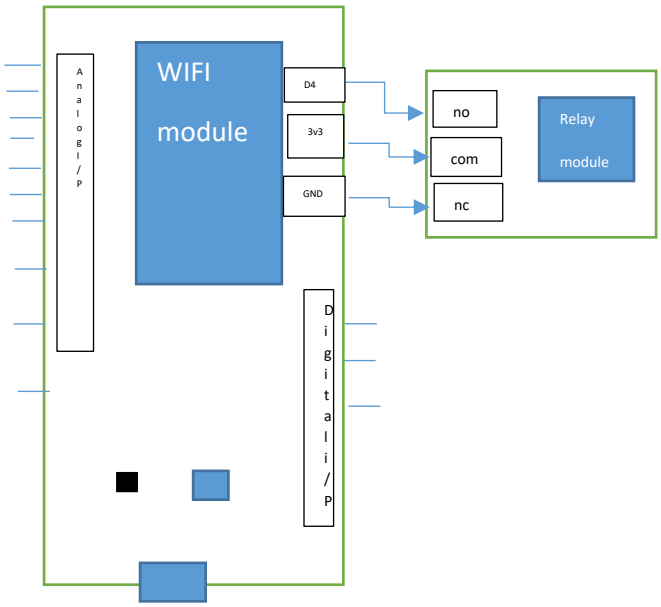


**Figure 4**

**Relay Connections:**

- Connect **Node-MCU** Ground (**GND**) pin to **-ve** pin of Relay**.**
- Connect **Node-MCU** Supply (**3v3**) pin to **+ve** pin of **Relay**.
- Connect **Node-MCU** Digital pin (**D4**) to Input pin of Relay

- **Relay** is basically act a **switch** between electrical load and Node-MCU.
- Relay have two configuration **NO** (**N**ormally **O**pen) & **NC** (**N**ormally **C**lose).
- Relay have coil which is energized by 5v, when coil energized switching action takes place, based on NO-NC configuration.
- If relay is **NO** configuration then when coil is energized switching action takes place from NO-NC then load will be connected.

**BLYNK APP:**

Blynk is a mobile app that allows users to easily build and control Internet of Things (IoT) projects without the need for extensive programming knowledge. With Blynk, users can create custom graphical user interfaces (GUIs) on their smartphones or tablets to remotely control and monitor hardware con Blynk is a mobile app that allows users to easily build and control Internet of Things (IoT) projects without the need for extensive programming knowledge. The app works by communicating with hardware devices via Wi-Fi, Bluetooth, or the internet using the Blynk cloud platform.

Users can choose from a wide range of pre-built widgets, such as buttons, sliders, graphs, and gauges, and customize them to their specific needs. They can also add custom code to their projects using a variety of programming languages, including C++, Python.


**Figure 5 Blynk App**

**Flowchart:**

In flow chart in figure 6 shows the how system is working through mobile using Blynk app using node-mcu and relay module. In this flow chart step wise process is defined we use embedded c programming language to interface with hardware and relay module to operate

Start the vehicle by switching on and off by mobile.

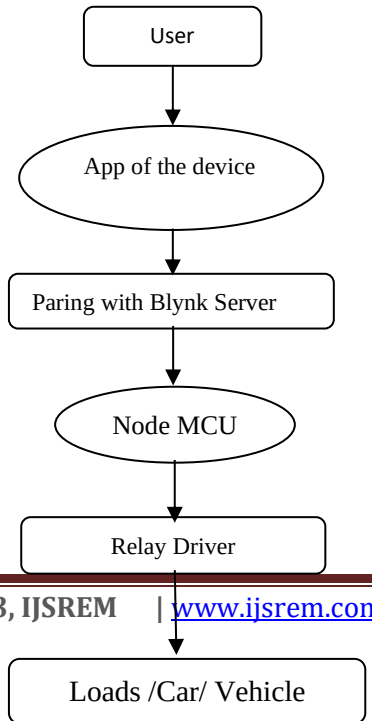


**Figure 6**

**Specifications of proposed system:**

- Easy to use
- Low power consumption
- High security
- Can be used anywhere in world
- Auto update status of mode
- When switch is on then it operates both manually and automatic
- Authorised device can share qr code for access device for trusted person.

**CONCLUSION:**

A keyless ignition system using the Node-MCU Wi-Fi module is a unique and innovative to integrating wireless technology into a vehicle's ignition system. This system offers the convenience of remote starting and stopping of the engine using a mobile device or computer, and the added security of requiring access to a secured Wi-Fi network in order to start the engine. Overall, the keyless ignition system using the Node-MCU Wi-Fi module has the potential to enhance the driving experience by offering greater convenience and security. This wireless ignition security system has been successfully designed as well as successfully tested. The Node-MCU controller based ignition system can be controlled using mobile application with user authentication, user friendly and free solutions to avoid vehicle theft. The same module can be implemented in industrial applications to protect precious material handling.

**FUTURE SCOPE:**

In future we can add Qr Code by authentication to the user to start the vehicle. Because of this we can assure the safety of vehicle. We can also modified by collecting the data of vehicle how many People driven the vehicle. We also add Gps to the model we track the vehicle.

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