



BIKE AUTOMATION SYSTEM

R. Prabha¹, S. Ravikiran², S. Sharanya³, I. Rajendraswamy⁴, R. Shandeep ram⁵

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SNS COLLEGE OF TECHNOLOGY, COIMBATORE-641035

ABSTRACT:

This paper proposes an economical implementation for IoT (Internet of Things) used for monitoring and controlling the appliances via the Internet. The Bike automation system uses portable devices such as Smartphones as a user interface. They can communicate with bike automation networks through the Internet. This project aims at switch on and off the bike and lock and unlock bike without key via Smartphone's using Wi-Fi as a communication protocol and an affordable and flexible bike control system using a node MCU microcontroller as a system. The microcontroller which acts as the server will be interfaced with relay circuits that control the system running at bike. The communication between the device and the mobile is SSD ID and password. The reason to develop this system is to help the people when they mis the bike key or forgotten to lock the bike along with maintaining security and convenience.

Index Terms:

Smart Automation, IoT, Microcontroller, Internet Protocol, Blynk Server, Home Automation and Control.

1.INTRODUCTION:

In today's world automation plays a crucial role in all working places, vehicles, shopping malls etc. The bike automation system is revolutionary these days where several producing companies are interfacing automation system in their every device. A smart bike automation system has become very useful for people to use their bike. In this system, bike automation and mobile phone can be monitored and controlled through a user-friendly interface. In this Smart bike automation system, we designed it to on and off the bike and lock and unlock the bike in our mobile phone using the Blynk app. Currently, automation techniques are implemented either using a computer, mobile phones or microcontroller.

Connecting things is becoming more and more crucial in today's IOT applications. Wi-Fi protocol is one of many methods for connecting items.

NodeMCU is an ESP8266-based opensource platform that connects things and enables data transfer using the Wi-Fi protocol. Additionally, by offering some of the most crucial microcontroller functionalities, including GPIO, PWM, ADC, and others, it may address many of the project's requirements on its own. ESP8266 NodeMCU has a two UART interfaces, UART0 and UART1, on the ESP8266 NodeMCU allow for asynchronous communication and have a maximum data rate of 4.5 Mbps. Use the TXD0, RXD0, RST0, and CTS0 pins for communication.

We require a platform known as the Internet of Things in order to connect consumers and appliances (IoT). The Internet of Things binds together multiple physical items to enable correct synchronization, communication, and interconnection between various physical devices or appliances from any location in the globe where the internet is accessible. IoT greatly improves automation while reducing human labour.

The automated technology minimises interactions with people. The node MCU microcontroller and Relay, coupled with driving circuitry, are the key components of the smart bike automation system using IOT. For powering high-powered appliances, relays are utilised. Because it uses a node MCU, another crucial aspect that contributes to this system's brilliance is its capacity to run Python-coded programmes. Python is designed to be a simple-to-read programming language that enhances system integration and speeds up labour.

The Internet is chosen among the many wireless connections available at the moment because of its appropriate capabilities. The Internet's capabilities are more than adequate for putting this plan into practise. Due to built-in internet connectivity

features on modern smartphones and PCs, the internet indirectly lowers the cost of the system. The programme is intended to enable communication between people and appliances. All the controls for turning the bike ON and OFF, locking it, and unlocking it are found in this programme. As a result, the automated system is more flexible and able to adapt to a vastly expanding civilization. Additionally, it offers comfort, security, convenience, and energy savings. The automation system primarily decreases the need for manual labour as well as the consumption of electrical energy.

It is simple to operate the gadgets utilising WIFI, 4G, and the soon-to-arrive 5G networks; there is no use in being without an internet connection. The goal of this bike automation system is to produce a straightforward, effective, and easily usable automation system that intelligently executes the predetermined commands set by the owner or end-user. Designing an integrated smart security system with the ability to lock and unlock the bike as well as maintain security is the main objective of a smart bike automation system.

2.LITERATURE SURVEY:

Harsh Mehta, Kunal Jadhav, Avinash Mishra, Prof. Anushree Deshmukh, Entitled as IoT based home automation system using Arduino board, [1] describes Many smart home automation solutions available today use the Arduino Uno as their server system. However, this method needs a lot of extra parts, which raises the price and circuit complexity. Since Arduino does not come with built-in Wi-Fi connectivity, an external Wi-Fi module must be used in order to connect Arduino and a smart phone to a network. This requires complicated circuitry. Since Arduino is not energy-efficient, it uses more electricity. Additionally, compared to the Raspberry Pi, Arduino operates slowly and does not provide an integrated development environment, making it a poor platform for future improvement.

Naresh Kumar, Praveer Sing. Economical Home Automation System using Arduino UNO, [2] While Zigbee, Bluetooth, and other communication technologies can be utilized in place of Wi-Fi, they only allow for control of devices that are within their respective ranges of the environment. Zigbee has a connectivity range of approximately 10-100m line-of-sight, but Bluetooth has a range of 100m.

Prof.H.B. Shinde, Abhay Chaudhari, Prafull Chaur, Mayur Chandgude Pratik Waghmare. Entitled Smart Home Automation System using Android Application, [3] Describes Creating a smart phone application that serves as a server and mobile interface is another way to do home automation. When employing this method, the user's smart phone must already have the program installed.

Prof. Dr. Ashok. J, Chavan J. J, Patil P. V, Naik P. S. Advanced Control Web Based Home Automation with Raspberry Pi, [4] by deploying a web page, describes home automation. Tokens can be created and utilized to create a straightforward web that can be used to control the appliances.

MA Khettat, S Bouaziz, H Imine, Motorcycle automation:

System approach[5] describes an automation project for a motorized two-wheeled vehicle. More specifically, a method of controlling a motorcycle in order to create an autopilot is suggested.

ALESSANDRO BEGHI and RUGGERO FREZZA: Advances in Motorcycle Design and Control [6] A variety of engineering disciplines must be combined in the design and development of modern road vehicles. Strict performance, reliability, and safety criteria are part of customer expectations.

3.HARDWARE DESIGN:

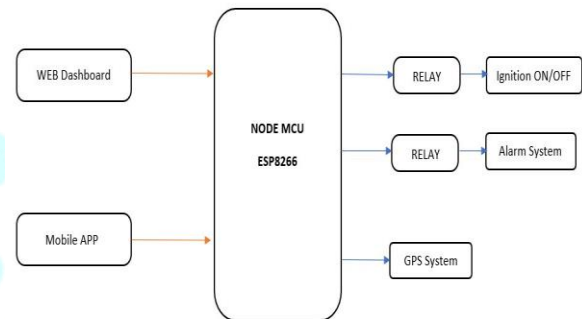
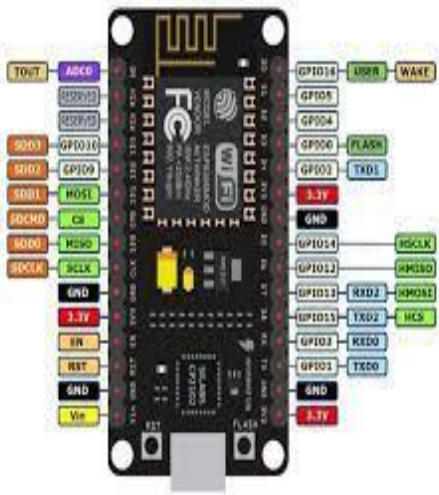


Figure: Block diagram

3.1 Node MCU:

A low-cost System-on-a-Chip (SoC) called the ESP8266 serves as the foundation of the NodeMCU (Node Microcontroller Unit), an open-source environment for developing both software and hardware. The ESP8266, created and produced by Espressif Systems, includes all of the necessary components of a computer, including a CPU, RAM, networking (Wi-Fi), and even a contemporary operating system and SDK. Because of this, it is a great option for all types of Internet of Things (IoT) projects. The ESP8266 is difficult to access and use as a chip, though. For the simplest operations, like turning it on or sending a keystroke to the "computer" on the chip, you must solder wires with the necessary analogue voltage to its pins. Additionally, you need to programme it in low-level machine instructions that the chip hardware can understand. Using the ESP8266 as an embedded controller chip in mass-produced devices is not problematic at this degree of integration. For amateurs, hackers, or students who want to test it out in their own IoT projects, it is a significant burden.



3.2 Relay:

The 4 Channel Relay Module is a handy piece of equipment that can be used to manage high voltage, high current loads such as motors, solenoids, lamps, and AC loads. It is built to communicate with microcontrollers like Arduino, PIC, and others. COM, NO, and NC relay terminals are removed using screw terminals. A LED that shows the relay's state is also included.

- Controllable digital output
- Suitable for any 5V microcontroller, including the Arduino.
- Throughput rated: 10A (NO) 5A (NC)
- Signal of control: TTL level
- 250VAC/30VDC maximum switching voltage
- 10A maximum switching current
- Dimensions: 76 x 56 x 17 mm.



3.5 Female pin header:

When you want to link a board to another board using jumper wires or plugging in another board, you need female pin headers. When you want to link a board to another board using jumper wires or plugging in another board, you need female pin headers. connecting two boards by plugging one into the female pin headers of the other. DIY boards for joining items together use female pin headers.



3.6 Jumper wires:

Jumpers are typically tiny metal connectors that are used to open or close circuit components. They have two or more connecting points that control a circuit board for an electrical system. They are responsible for setting up the motherboard and other computer devices. Imagine your motherboard has intrusion detection capabilities. It is possible to enable or disable a jumper. Electrical wires having connector pins at each end are known as jumper wires. They are employed to connect two circuit points without the usage of solder. Jumper wires can be used to change a circuit or find issues in a circuit. Additionally, they work best when bypassing a suspected-faulty area of the circuit that lacks a resistor. This includes a wire or other protrusion.

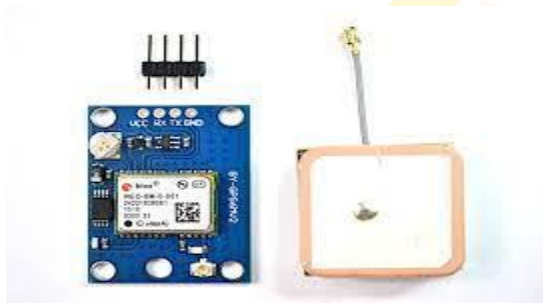


3.4 Male pin header:

The simplest kind, male headers, are often included with any board that supports them. If you want to create a solderless or permanent breadboard out of your project, use

3.7 GPS Module:

Trilateration, a technique used by one of the GPS systems, is a method for locating a specific spot on the Earth by using satellite data. While this is going on, a GPS receiver triangulates radio signals to determine the separation between satellites. As seen in this figure, triangulation, which measures angles, is comparable to trilateration (Tim Gunther, 2020). GPS modules include teeny processors and antennae that are specifically tuned to receive data from satellites. From there, it will get timestamps and other information from all of the visible satellites. The module can precisely determine its position and time if its antenna can detect four or more satellites. The BDS (Beidou), GLONASS, and GALILEO satellite navigation systems are among the four well-known Global Navigation Satellite Systems. The Global Positioning System (GPS), which was first used in the US and is currently the most advanced technology, is the oldest. The other three biggest satellite navigation systems in the world, BDS, GLONASS, and GALILEO, are now being updated.



5.RESULTS:



Figure: Bike Setup Install

4. PROPOSED WORKING:

The android OS provides the flexibility of using the open source. The inbuilt sensors can be accessed easily. The application used to control the system has the following features. Android Phone acts as a client and data are sent via sockets programming. The application takes command from user in following modes.

- Switch mode: Switch mode uses the radio buttons that are used to control the home appliances. The radio button sends the status of the switch.

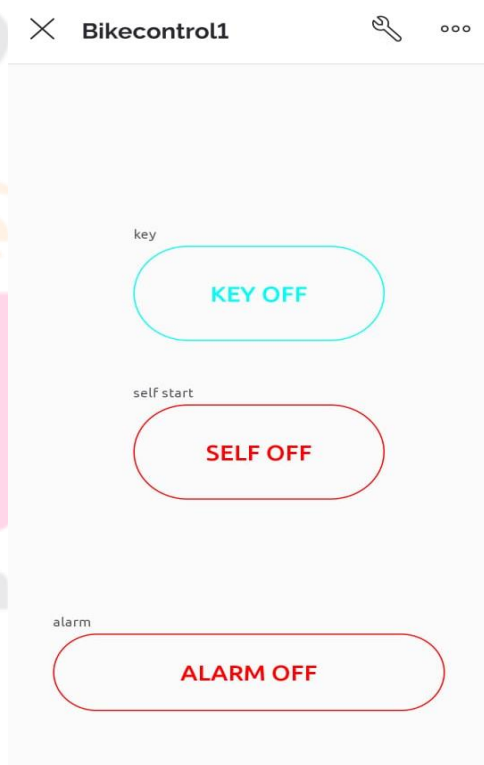


Figure: Blynk App Control

6.CONCLUSION AND FUTURE WORK:

In this technologically evolved world, we have created and implemented a bike automation to improve the quality of human existence. Our method primarily addresses issues that people encounter on a daily basis. User hardly needs a phone and an Android app to be installed on that

phone. We were able to create a low-cost, adaptable smart bike system by utilizing today's highly developed boards. This offers effective automation that is user-friendly. Current bike Only a few applications can be automated, monitored, and controlled remotely using this technology without any problems. The technology incorporates a mobile application to control or monitor the bike by turning it on and off and locking and unlocking it.

The majority of human interactions are reduced or eliminated by this approach. Internet of Things is used to develop such as smart home (IOT). It is a completely affordable device for everyone who wants to make their bike as intelligent as possible.

7.REFERENCE:

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