

PROJECT MANUAL FOR → “LED-control using Portable Server”

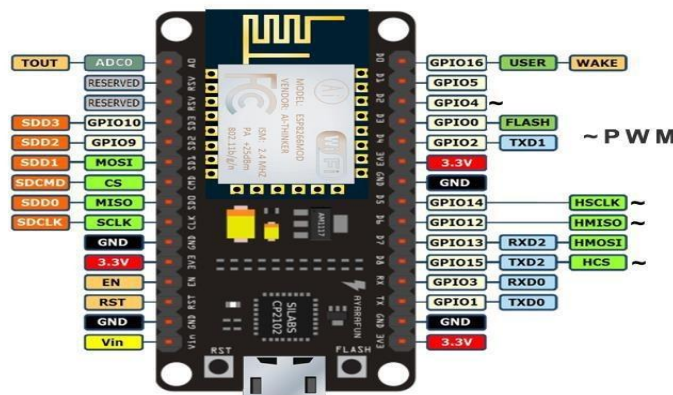
IoT or Internet of Things is simply the network of interconnected things/devices which are embedded with sensors, software, network connectivity and necessary electronics that enables them to collect and exchange data making them responsive.

COMPONENTS:

1. Hardware

NODEMCU

- NodeMCU module is mainly based on [ESP8266](#) that is a Wi-Fi microchip incorporating both a full TCP/IP stack and microcontroller capability. It is introduced by manufacturer Espressif Systems – A manufacturer based in Shanghai, China. NodeMCU V3 is an open-source firmware and development kit that plays a vital role in designing your own IoT product.
- NodeMCU V3 comes with a number of GPIO Pins. Following figure shows the Pin out of the board.



NodeMCU-pin configurations



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Features:

- Open Source and Arduino-like hardware
- Status LED
- MicroUSB port
- Reset/Flash buttons
- Interactive and Programmable
- Low cost
- ESP8266 with inbuilt wifi
- USB to UART converter
- GPIO pins

Technical Specifications

NodeMCU v3 is a development board which runs on the **ESP8266** with the Espressif Non-OS SDK, and hardware based on the ESP-12 module. The device features 4MB of flash memory, 80MHz of system clock, around 50k of usable RAM and an on chip Wifi Transceiver.

2. SOFTWARE

ARDUINO IDE

- Arduino IDE is an open source software that is mainly used for writing and compiling the code into the Arduino Module.
- It is an official Arduino software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process.



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- It is easily available for operating systems like MAC, Windows, Linux and runs on the Java Platform that comes with inbuilt functions and commands that play a vital role for debugging, editing and compiling the code in the environment.
- A range of Arduino modules available including Arduino Uno, Arduino Mega, Arduino Leonardo, [Arduino Micro](#) and many more.
- Each of them contains a microcontroller on the board that is actually programmed and accepts the information in the form of code.
- The main code, also known as a sketch, created on the IDE platform will ultimately generate a Hex File which is then transferred and uploaded in the controller on the board.
- The IDE environment mainly contains two basic parts: Editor and Compiler where former is used for writing the required code and later is used for compiling and uploading the code into the given Arduino Module.
- This environment supports both C and C++ languages.

STEPS TO DO THE PROJECTS

How to connect NodeMCU with Arduino IDE?

1. Include the given below .json file from files-> preferences
http://arduino.esp8266.com/stable/package_esp8266com_index.json
2. Set up ESP8266 community from Tools->boards-> boards manager
3. Select board NodeMCU 0.9 from Tools->boards



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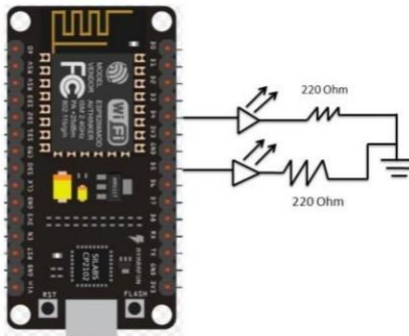
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LAST FEW STEPS ;

- Code Your NodeMCU .
- Change the ssid and password String of the code according to your mobile’s hotspot or Router.
- Upload the code. Then open serial Monitor, you can see the local IP of the NodeMCU iff it is connected with your WLAN.
- Open the browser of the your mobile phone (it can be any device but that device must be present in the same network as of NodeMCU). After opening the browser , just the hit the IP (the local IP of the NodeMCU). One webpage will open, from which You can now control the GPIO pins of the NodeMCU, here we have connected leds as shown in the circuit diagram.

Circuit Diagram



Applications of THIS PROJECT

- IoT based Smoked Alarm
- Home Automation
- Security Alarms
- IoT sensor Network
- Surveillance and security

