



## **AN IOT BASED FIRE ALARMING AND AUTHENTICATION SYSTEM FOR WORKHOUSE**

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### **ABSTRACT**

Ensuring minimum rights and safety of the garment workers has become a burning issue nowadays. The workers of garment factories are facing some labyrinths and broken out of fire is surely one of them. The investors are losing their interest and the prominence of this sector is getting toneless. In this paper, we have propounded a system which is capable to detect fire. The LM35 sensor and WIFI Modules will be interfaced with Node MCU microcontroller. When any fire is identified then the information will be updated in the IOT web-server to give the real time information to the authorized persons. A relay is used to activate the fire suppression device. The alarm gets activated to alert the nearby users.

### **INTRODUCTION**

A system to detect fire and alarm the employees before fire breaks out is a crying need. An IoT based fire alarming system can be used to help and detect fire as soon as possible and save precious human lives. The system will use several sensors to detect any symptoms of fire. The sensors will be placed on proper places after doing surveys on the factory for its vulnerable places of fire. After choosing the best places for placing the sensors, the sensor will be activated. The data collected by sensors will be sent to node MCU microcontrollers placed on

various places. The microcontroller will then process the data. Intelligent algorithm is used to decide when to start alarm for fire. Besides, the system will start firing suppression system, like opening fire extinguishing water valves.

Internet of Things (IoT) is the networking of physical objects that contain electronics embedded within their architecture in order to communicate and sense interactions amongst each other or with respect to the external environment. In the upcoming years, IoT-based technology will offer advanced levels of services and practically



change the way people lead their daily lives. Advancements in medicine, power, gene therapies, agriculture, smart cities, and smart homes are just a very few of the categorical examples where IoT is strongly established. Over 9 billion ‘Things’ (physical objects) are currently connected to the Internet, as of now. In the near future, this number is expected to rise to a whopping 20 billion.

### **NODE MCU ESP8266**

Microcontroller as the name suggest, a small controller. They are like single chip computers that are often embedded into other systems to function as processing/controlling unit. For example, the control you are using probably has microcontrollers inside that do decoding and other controlling functions. They are also used in automobiles, washing machines, microwaves ovens, toys etc, where automation is needed. The Node MCU ESP8266 development board comes with the ESP-12E module containing ESP8266 chip having 32bit LX106 architecture microchip. This microchip supports RTOS and operates at 80MHz to a hundred and sixty megacycle adjustable clock frequency. Node MCU has 128 KB RAM and 4MB of non-volatile storage to store information and programs. Its high process. Power with in-built Wi-Fi /

Bluetooth and Deep Sleep operational options creates it ideal for IoT comes. Node MCU will be powered victimization small USB jack and VIN pin (External provides Pin). It supports UART, SPI, and I2C interface. The Node MCU Development Board will be simply programmed with Arduino IDE since it's straightforward to use. Programming Node MCU with the Arduino IDE can hardly take 5-10 minutes. All you would like is that the Arduino IDE, a USB cable and also the Node MCU board itself.

### **HARDWARE COMPONENTS**

Transformer is a static device used to convert the voltage from one level to another level without change its frequency. There are two types of transformers

1. Step-up transformer
2. Step-down transformer

Step-up transformer converts low voltage level into high voltage level without change its frequency.

Step-down transformer converts high voltage level into low voltage level without change its frequency.

In this project we using step-down transformer which converts 230V AC to 12V AC [or] 230V AC to 5V.



While the output of the half-wave rectifier is DC (it is all positive), it would not be suitable as a power supply for a circuit. Firstly, the output voltage continually varies between 0V and  $V_s - 0.7V$ , and secondly, for half the time there is no output at all.

#### The Full-wave Bridge Rectifier

The circuit in figure 3 addresses the second of these problems since at no time is the output voltage 0V. This time four diodes are arranged so that both the positive and negative parts of the AC waveform are converted to DC.

The capacitor-input filter, also called "Pi" filter due to its shape that looks like the Greek letter pi, is a type of electronic filter. Filter circuits are used to remove unwanted or undesired frequencies from a signal.

A typical capacitor input filter consists of a filter capacitor C1, connected across the rectifier output. The capacitor C1 offers low reactance to the AC component of the rectifier output while it offers infinite reactance to the DC component. As a result, the AC components are going to ground. At that time DC components are feed to Regulator.

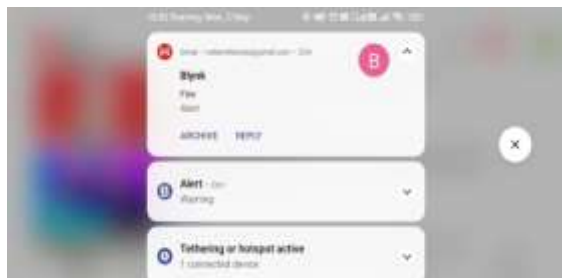
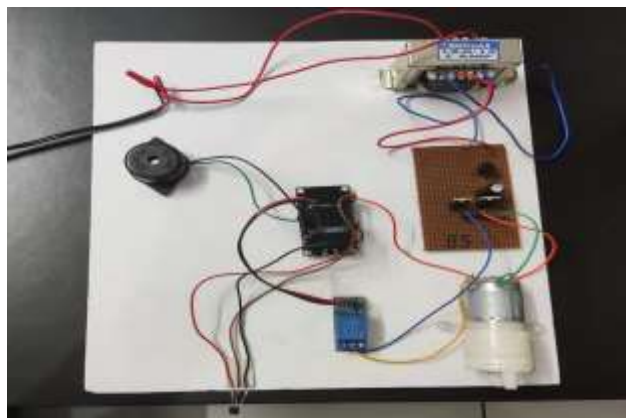
A DC motor is designed to run on DC electric power. Two examples of pure DC designs are Michael Faraday's homopolar

motor (which is uncommon), and the ball bearing motor, which is (so far) a novelty. By far the most common DC motor types are the brushed and brushless types, which use internal and external commutation respectively to create an oscillating AC current from the DC source so they are not purely DC machines in a strict sense.

#### WORKING

- The LM35 sensor is sensitive to temperature.
- The LM35 sensor is connected at A0 pin to give the analog input to the NodeMCU and buzzer is connected at D3 pin to get analog output from the NodeMCU.
- Initially the temperature will be normal when there is no fire. When fire is detected by the LM35 sensor, then the analog values will start to rise and buzzer turns on.
- Further, a fire suppressor is connected to the relay which helps in suppressing the fire.
- In this project we will be using Blynk esp8266 based NodeMCU.
- When the fire is detected, a Blynk notification and an E-mail will be sent to your smartphone. This is how an IoT based

fire alarming and authentication system for work house works.



## CONCLUSION

We have discussed about the latest technology that can help to reduce catastrophic accidents caused by fire. We designed the whole system and evaluated its effectiveness as well as scalability. With the improvement of sensor technology, the system will become more efficient and

useful. If this system can be successfully integrated in every factory, then it is hoped that the loss of life and property due to the fire accidents will reduce remarkably and the country's economy will not be stumbled by such tragic and unexpected accidents.

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