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IOT Based Electrical Switching Circuit for the Safety of Human and Electrical System

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Abstract: ***In this paper, we present an IoT-based electrical switching circuit that ensures the safety of both humans and electrical systems. The circuit has the capability to be broken manually by inserting a password via Wi-Fi and automatically by sensing smoke and temperature using smoke and temperature sensors. The proposed system provides an efficient and effective way to protect against electrical hazards.***

Keywords: IoT, Electrical Switching Circuit, Safety, Human, Electrical System, ESP8266 Wi-Fi module, Smoke Sensor, Temperature Sensor, Relay, Cloud Server, Hazard, Manual Break, Automatic Break.

I. INTRODUCTION

The Internet of Things (IoT) has emerged as one of the most significant technological advancements in recent years. The IoT technology has been extensively utilized in various fields, including home automation, healthcare, energy management, and security. The integration of IoT into electrical systems has opened up new possibilities for improving the safety of both humans and electrical systems. In this paper, we present an IoT-based electrical switching circuit that ensures the safety of both humans and electrical systems.

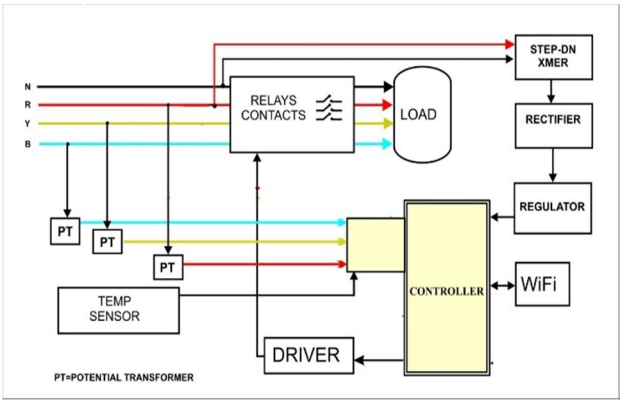
II. METHODS

The proposed system consists of an ESP8266 Wi-Fi module, a smoke sensor, a temperature sensor, and a relay. The ESP8266 Wi-Fi module is used to communicate with the cloud server and control the relay. The smoke and temperature sensors are used to sense any potential hazards and alert the system. The relay is used to control the electrical circuit, which can be broken manually by inserting a password via Wi-Fi or automatically by sensing smoke and temperature.

The ESP8266 Wi-Fi module is a highly integrated wireless chip that can be used as a microcontroller with built-in Wi-Fi capabilities. The module can connect to the cloud server via Wi-Fi and control the relay, which is connected to the electrical circuit. The smoke sensor and temperature sensor are used to sense any potential hazards in the environment. The smoke sensor can detect smoke particles in the air, while the temperature sensor can detect any significant changes in temperature. When the sensors detect any potential hazards, they send a signal to the ESP8266 Wi-Fi module, which then breaks the circuit by controlling the relay.

The proposed system also provides a manual way to break the circuit by inserting a password via Wi-Fi. This ensures that only authorized persons can control the circuit, thereby preventing any unauthorized access. The manual break of the circuit is controlled by the cloud server, which verifies the password before breaking the circuit.

Block Diagram



Microcontroller as we are using hear AVR microcontroller with the help of sensor to read data and process it and compare it wheather to activate circuit breaker or to trip it. To operate microcontroller we required 5v dc supply. but the mains maximum voltage available is 220 volt. with the help of step down transformer we have to convert 220 volt to 12 volt The output of the transformer will be ac but the requirement is dc.so with the help of rectifier we will convert 12 volt ac to 12 volt dc. The 12 volt dc is directly proportional to input of 220 volt ac. if there is any fluctuations in 220 volt ac then 12 volt dc will also gets fluctuates. 12 volt dc we can't give directly to microcontroller.so with the help of regulation circuit we convert 12 volt dc to 5 volt dc and provide to microcontroller Regulator is provided hear because if there will be any fluctuations in the input the regulator will provide constant output 5 volt. When controller is on it will sense all the data from internal analog to digital converter. Converter will process it internally and display it on LCD

III. RESULTS

The proposed system provides an efficient and effective way to protect against electrical hazards. The automatic break of the circuit by sensing smoke and temperature ensures that the circuit is broken in case of any potential hazards, preventing any further damage. The manual break of the circuit by inserting a password via Wi-Fi ensures that only authorized persons can control the circuit, thereby preventing any unauthorized access. The proposed system provides a reliable way to protect against electrical hazards and ensures the safety of both humans and electrical systems**.**

IV. CONCLUSION

In conclusion, the proposed IoT-based electrical switching circuit provides an efficient and effective way to ensure the safety of both humans and electrical systems. The proposed system provides a reliable way to protect against electrical hazards and ensures that only authorized persons can control the circuit. The system can be further improved by adding more sensors and providing a more secure way of communication. The integration of IoT technology into electrical systems has opened up new possibilities for improving the safety of both humans and electrical systems, and the proposed system is a step in that direction.

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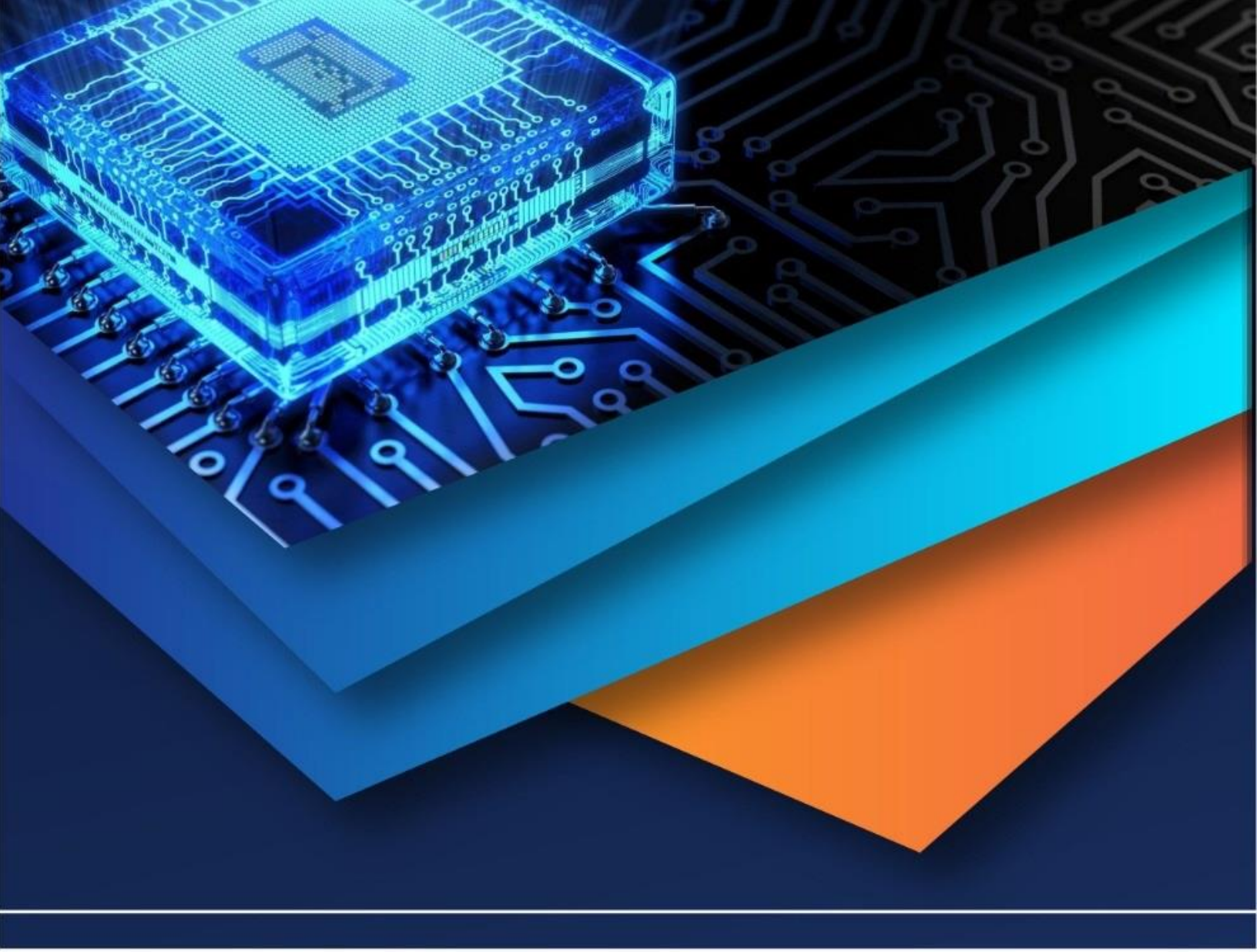

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