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IOT BASED PROTECTION SYSTEM FOR WIREMAN

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ABSTRACT

The main purpose of our project is to protect wireman from various fatal accidents which occur knowingly or unknowingly, these accident may cost them their life, so implementation of our project may act as a life saviour for the wireman. In this project we have used IoT, making full use of this internet-driven era. IoT will work in synchronous with relays to break the circuit hence De-energizing the circuit and providing a safer working environment for the wireman to work. The heart of our project is microcontroller AT89C52 which controls the system. And the communication of IoT devices is through thing speak website.

Keywords: Internet Of Things(Iot), Microcontroller, Thingspeak, AT89C52.

I. INTRODUCTION

As we know there are news about the wireman losing his life due to fatal electrical accidents at regular intervals and there aren't many systems which provides protection to them and a safer environment to work. In past 3 years, more than 1400 wiremen have lost their lives due to various accidents. There aren't any proper guidelines and infrastructure for them where they would work without any risk. Also, some accidents occur due to lack of communication between the workers because the place of work is far apart from the substation and they find it difficult to synchronize the work which results in unwanted accidents. Also, there are many vacancies in this sector and those vacancies aren't being filled up by government which results in overworking of currently employed workers as a result of which they take the security out of equation and just focuses on to wrap the work early and go home as soon as possible. These are many reasons why we need to give them a safer working environment, as we are living in an internet-driven era so why not use the internet and design something which would help them. So this is where our project i.e. IoT Based Wireman System comes into the picture, our aim is to Implement an IoT-based protection system for wireman taking manual intervention out of the equation. The main focus of this system is to implement the protection system for wireman. The system is designed to control a circuit breaker. There exists a number of ways to protect workers from the threat of electrical hazards, some of them are:

- De-energize the circuit
- Work Practises
- Insulation
- Guarding
- Barricades
- Grounding (Secondary Protection)

From the above list, practises like insulation, guarding, grounding is done frequently at each and every pole and substation but still lot of accidents takes place.

So our project **" IoT Based Protection System For Wireman"** uses the concept of " De-energizing The Circuit".

II. METHODOLOGY

The first and foremost is to detect the wireman or we call linesman on the electric pole. After the detection we need to communicate and transfer the signal to the substation. The last objective which can be the ultimate result is to cut off the supply. There are 2 circuits, the first one is transmitter circuit and the second one is receiver side circuit. The placements for the transmitter circuit is quite clearly understood as we need to transmit the signal of wireman onto the pole to cut off the supply this circuit will be on the electric pole. The receiver circuit will be placed on to the area specific transformer which can then cut down the supply from that particular transformer

Detection of wireman on the pole can be done by sensing the pressure on the pole for which we have used the pressure sensor i.e Piezo Crystal Pressure sensor. Our motto is to detect the pressure on complete pole but

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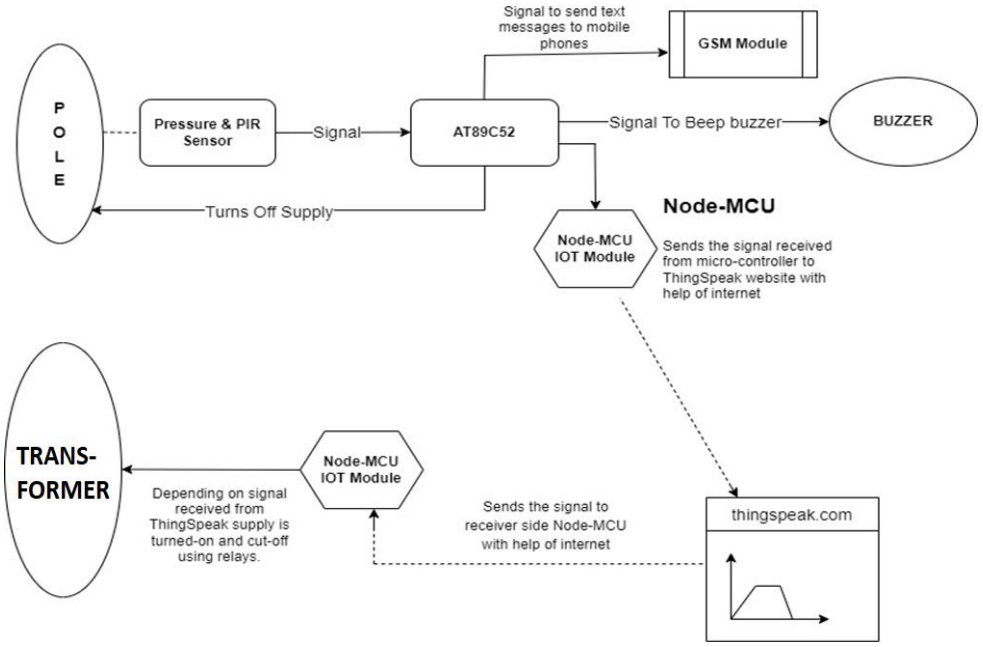
pressure sensor will sense it in a particular region where it is placed. To remove this loop-hole we have used PIR sensor, which is a motion sensor which can detect motion on the pole.

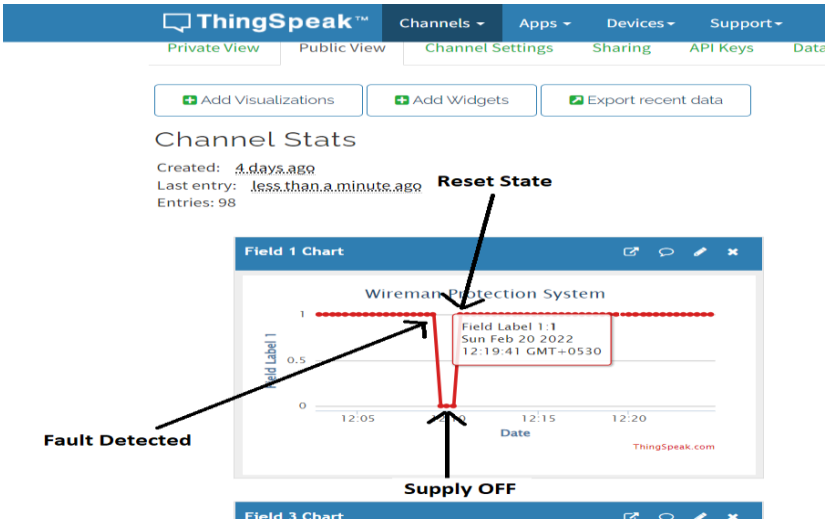
Depending on the signal received, we need to control some actions where in microcontroller comes into play. We have connected the sensors to the microcontroller and programmed it in such a way that it will raise the flag and help us to cut off the power supply on the electric pole through the attached relay. Also we can indicate that the work on the pole is in progress by connecting LCD display and Buzzer to the controller. The controller will be connected to an IoT module that is Node-MCU, which can help us display the supply statistics on the website for which we will be using Thingspeak. This will help us to get the information of particular pole in particular area.

The most important part of the project is transmitting the signal from transmitter circuit to the receiver circuit so as to cut-off the power supply from the transformer for which we have used Node-MCU which is connected to the microcontroller, which will transfer the signal with help of internet. The receiver circuit will have the another Node-MCU which will receive the signal from the Thingspeak website. Depending on the received signal the Node-MCU will turn on/off the relay as a result of which the transformer will cut-off the power supply.



III. RESULTS AND DISCUSSION

The project has been tested with both pressure sensor and PIR sensor sending signals to Thingspeak website through IoT module showing normal and faulty states.



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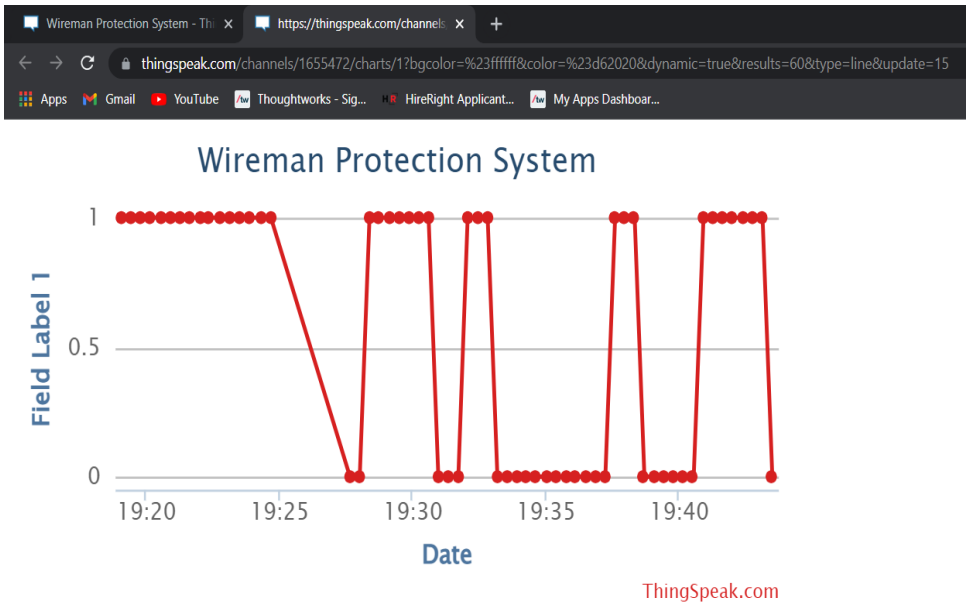

Figure: Graphs of signals on thingspeak website

IV. CONCLUSION

As we live in an internet driven era where internet is available everywhere, so we have used IoT which will increase the performance of system by making the signal reception and transmission even more faster. Hence internet is the major and mandatory ingredient in working of the system. Even the signal from the pressure sensor and motion sensors are transmitted at a very fast rate, hence reducing the delay in transmission of signal. The only delay which is measured in the working of system is that of thingspeak website, it is because we are using a free version of the website, once we start using the paid version the efficiency and performance of system will only get better.

The effective protection of wireman at the time of repairing is achieved by the system with successful two way circuit breaking.

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