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Under Ground Fault Monitoring system Using Cloud Computing and IoT

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Abstract: An underground fault monitoring system project's major objective is to develop and put into use a system that can quickly identify and pinpoint faults in subterranean power cables. The system uses a network of sensors put along the cable's length to monitor and communicated at a on a variety of characteristics, including temperature, vibration, and current. For analysis to a central control unit. Advanced algorithms are used by the control unit to process the data and find any anomalies or potential problems. The system alerts the maintenance crew in real time when a fault is found, allowing them to swiftly find and fix the issue. Reducing the possibility of failure is the project's main objective in order to increase the availability and dependability of the electricity system.

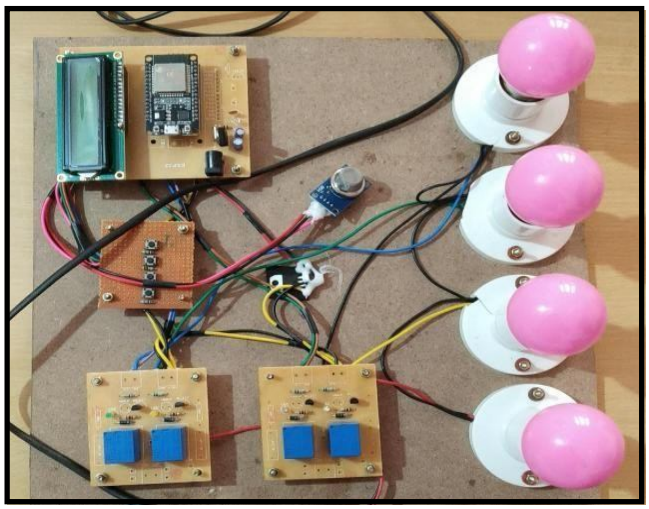
I. INTRODUCTION

The growth of the electrical system grid has resulted in extensive use of underground cables. In recent decades, cables were manufactured to hangover head; today, they are made to hang underground, which is better than in the past. Because unfavorable weather conditions including storms, snow, heavy rain, and pollutants have no effect on underground cables. But it is challenging to pin point the precise location of a defect when it affects an underground wire. Due to losses, the cable wire's effectiveness is suddenly affected since it is extremely difficult to physically locate the specific location or faulty site. Today, a variety of strategies have been put into practice to find cable line faults. However, the issue now is how to access or retrieve the information connected to the location of the fault whenever it is needed, as well a show to identify a fault in cable wire while it is undergrounded We put for the system that pin points the position of the problem and uses the Internet of Things to serially broadcast that location to a server in order to close those gaps.
The project "IOT- based underground cable line fault detection system" is employed to identify and locate the faults the manual approach takes a long time. Here, we suggest cable failure detection over IOT, which pinpoints the exact location of the defect and simplifies the repair process. Locating and identifying cable faults might be difficult due to the subterranean cable's in accessibility.

The methods for finding and locating faults are crucial in maintaining. Today's cables a redesigned to run underground rather than overhead because this method is better than the earlier one. Underground cables are not affected by inclement weather such as to retinal rain, snow, storms, or pollutants. Because it is challenging to locate an underground cable fault, a mechanism must be developed to pinpoint its precise location. Because the world is becoming more digitalized, our method is to locate the underground cable fault in a digital manner. This is because our goal is to serve the digitally. Today, installing subterranean cable systems is a wide spread practice in many urban areas. There are many causes for events that result in faults in the process associated with fixing that particular underground link is challenging since it is difficult to pinpoint the exact location of the cable problem. The existing technology for finding cable faults is heavy, and sometimes more than one way is needed to find the problem in an underground cable because one method is insufficient to find the defect. It takes a lot of time to coordinate many tests with sophisticated equipment to determine the malfunction. We need quick and accurate problem location techniques that can reduce significant operating and financial loss if we want to hasten system renovation.

II. RELATEDWORK

The main objective of this project is to develop to identify the cable fault, first. Using IOT and cloud computing to pinpoint the precise location of a cable issue and this project aims to detect LPG Gas leakage.

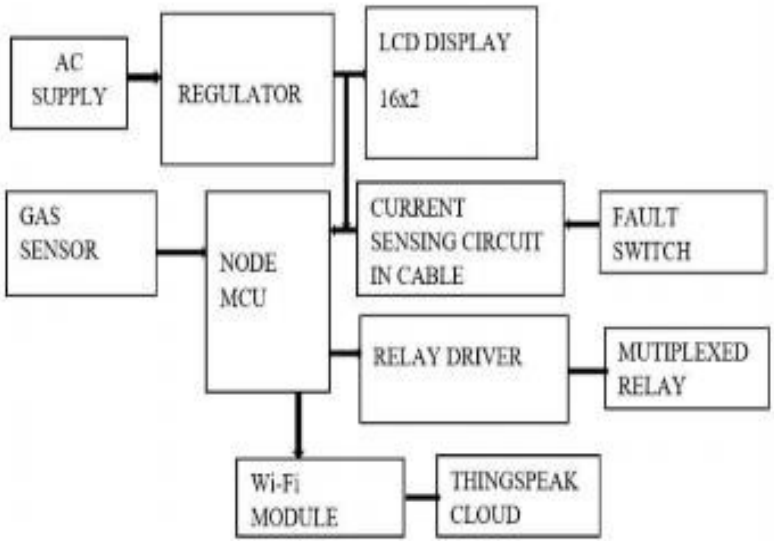


III. PROPOSED MODEL

The proposed System design is a process of giving detailed information about the proposed work in a physical format. Different designs are built for the development of the system, which describes features, components that are included, and how the client interacts with a system. Key components makeup a core design for fault monitoring. First, it entails carefully positioning sensors to cover important parts and spaces. These sensors sought to be able to keep an eye on the necessary parameters. Second, real-time sensor data is gathered and stored for analysis by a centralized data-collecting system. Thirdly, sophisticated approaches and algorithms are used to find anomalous patterns or departures from normal behavior. Finally, a reliable Notification system is put into place to inform operators or maintenance staff of any issues found. Through pro active maintenance, timely fault detection, and continuous monitoring provided by this architecture, system reliability is increased, and downtime is decreased.

a. HARDWARE

There are totally 10 components used here , LCD Display, Node MCU, Regulators, Relay driver Multiplexed, Relays, Fault Switch, Wi-fi Thing Speak Cloud, Converter, MQ-2 Gas Sensor and SIM800.

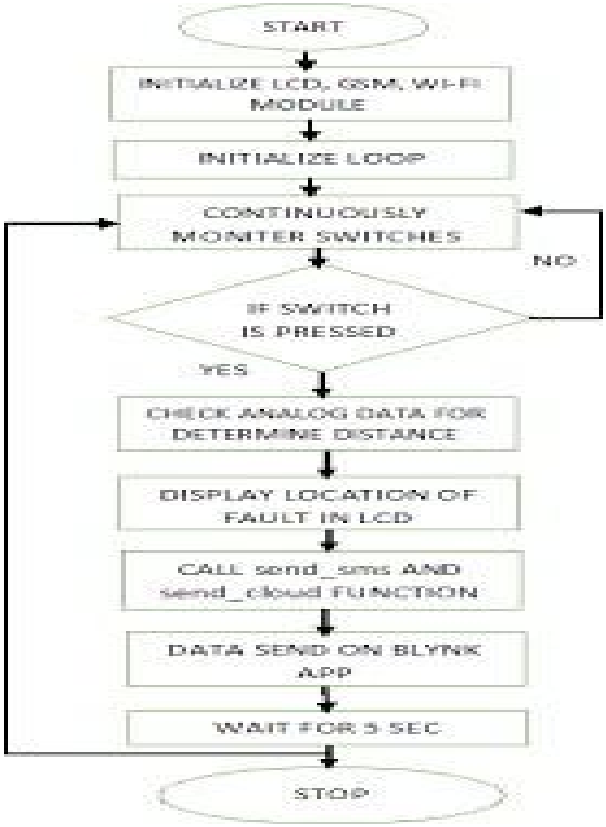


b. SOFTWARE

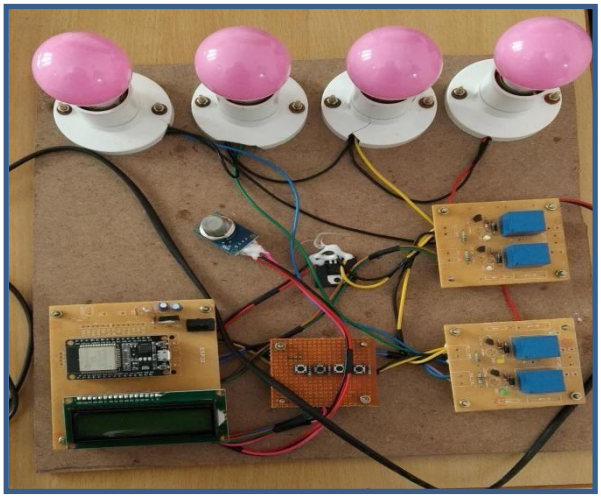
The Arduino IDE (Integrated Development Environment) is software tool used for programming and developing applications for Arduino boards. It provides a user-friendly interface that simplifies the process of writing, compiling, and uploading code to the Arduino microcontroller. The IDE is designed to be accessible to beginners and experienced developers alike. It supports the Arduino programming language, which is a simplified version of C++ with additional libraries and functions specific to Arduino boards.

This makes it easier to get started with programming and develop projects quickly. The IDE features a text editor where users can write their code, with syntax highlighting and auto-completion for improved productivity. It also includes a serial monitor that allows users to communicate with the Arduino board and debug their applications by displaying messages and sensor data in real time. The Arduino IDE provides a straight forward process for compiling and uploading code to the Arduino board. Once the code is written, users can simply select the appropriate board and port, and click the "Upload" button. The IDE handles the compilation and transfers the code to the board, ready for execution.

c. FLOW CHART



RESULT



CONCLUSION

Fault detection is greatly facilitated by IoT-based underground cable line fault detection systems. It is able to pinpoint precisely where the defect has occurred. 0nly the area where the fault occurred needs to be excavated by the repairman. With the aid of the IoT Cloud, it is possible to identify and find defects in subterranean cables in a sequential manner that is useful for fault detection and localization.

As the saying goes, "Necessity is the mother of all inventions," it was realized there was a need for software that would control equipment and processes. The design strategy employed here produced acceptable results, and the microcontroller is adequate for measuring the necessary parameters. The device's measurements a requite accurate, and the power consumption has been kept as low as feasible. In order to address the issue, highly interactive, user-friendly embedded technology using microcontroller was developed. The newly designed module will simplify the process. The user module has reduced human labor requirements while simultaneously improving comfort. Consequently, the module is working quite well as a tool. The software would become a useful tool for the user if the future improvements mentioned previously were included.

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