

DESIGN OF IOT BASED UNDER-GROUND CABLE FAULT DETECTOR

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Abstract -Main aim of the proposed system is to find the exact location of the cable fault. This project will increase the demand for cable production technology. To determine the distance of underground cable fault from Base station in kilometers, to minimize the fault occurrence in power system and rapidly clear the fault and resolve the faults in very short period of time. It also improves public safety. This IOT Technology is used to find out the exact location of the fault and to send data in graphical format to our website using an IOT Module at the same time it displays on the LCD screen. This paper uses the standard theory of Ohm's law, i.e., when a low DC Voltage is applied at the feeder end through a series resistor (Cable lines), then the current would vary depending upon the location of the fault in the cable. As the resistance is proportional to the distance. In case there is a short circuit (Line to Ground), the voltage across series resistors changes according to the resistance that changes with distance.

Keywords: underground cable system, IOT technology, ohm's law, atmega 16 microcontroller.

1. INTRODUCTION

This project is work for reducing the problem of cable faults and repairing them on time. System detects the location of fault in underground cables. By using Wi-Fi model, its serially communicated towards the server. The proposed system detects the exact location of the fault and by the means of IOT it's serially communicated towards server. Till now

many techniques had already been implemented in order to detect fault in cable wire. But the problem

came up is how to detect fault in cable wire. Various types of fault detection in underground cables, viz. single line fault, line to line fault, earth fault using Ohm's law. Frequent fault in underground cable due to adverse weather condition such as heavy rain falls, snow or due to chemical reaction and most underground faults are located by unearthing the entire length of cable to enable visual inspection to be carried out. The research work will help identification and location of underground cable fault without unearthing the entire length of cable using IOT technology. This project is work for reducing the problem of cable faults and repairing them on time.

Fault can be classified as two groups:

1. **Open circuit fault:** Open circuit faults are better than short circuit fault, because when this fault occurs current flows through cable becomes zero. This type of fault is caused by break in conducting path. Such faults occur when one or more phase conductors break.
2. **Short circuit fault:** Further short circuit fault can be categorized in two types:
 - **Symmetrical fault:** Three-phase fault is called symmetrical fault. In this all three phases are short circuited.
 - **Unsymmetrical fault:** In this fault magnitude of current is not equal-displaced by 120 degree.

Fault location methods can be classified as:

1. **Online method:** This method utilizes process the sampled voltages & current to determine the fault points. Online method for

underground cable is less than overhead lines.

- Offline method:** In this method special instrument is used To test out service of cable in the field. In this method fault point is detected by Walking on the cable lines. Fault point is indicated from Audible signal or electromagnetic signal .It is used to pinpoint Fault location very accurately.

LITERATURE SURVEY

Frequent fault in underground cables due to the breakdown Of paper plastic insulation & another reasons. Most underground faults are located by unearthing the entire Length of cable to enable visual inspection to be Carriedout.

we propose cable fault detection over IOT that detects the Exact fault position over IOT that makes repairing work very Easy. The repairmen know exactly which part has fault and Only that area is to be dug to detect the fault source. This Saves a lot of time, money and efforts and also allows to Service underground cables faster. In this paper we present two methods which will be very useful to identify The exact distance of fault of underground system from base station. The research work will help in identification and location of underground Cable fault without unearthing the entire of the cable before repair. Replacing entire cable due to difficulty in locating the fault. when any fault like short circuit occurs, voltage drop will vary depending On the length of fault in cable, since the current varies. A set of resistors are therefore used to represent the cable and a dc voltage is fed at one end. And the fault is detected by detecting the change in voltage using a analog To voltage converter and a microcontroller is used to make the necessary Calculations so that the fault distance is displayed on the LCD display. This prototype uses the simple concept of OHM's law. The Current

would vary depending upon the length of fault of the Cable. This prototype is assembled with a set of resistors Representing cable length in Kilo meters and fault creation is Made by a set of switches at every known Kilo meters (km's) To cross check the accuracy of the same

2. PROPOSED WORK

Fig 3.1: Block diagram of purpose system.

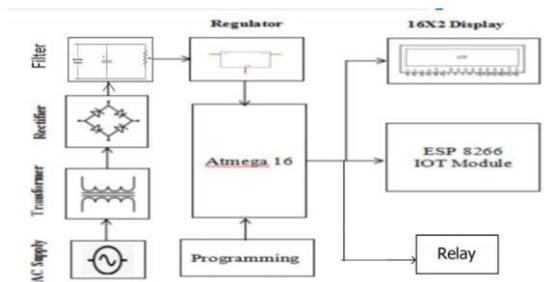
Our project is work for reducing the problem of cable faults and repairing them on time. System detects the location of fault in underground cables. By using Wi-Fi model, its serially communicated towards The server. Various types of fault detection in underground cables, viz. Single line fault, line to line fault, earth fault using Ohm's law. The proposed system detects the exact location of the fault and by the means of IOT it's serially communicated towards server. Till now many techniques had already been implemented in order to detect fault in cable wire. But the problem came up is how to detect fault in cable wire. Circuit diagram shows the working of project. The short circuit fault at a particular distance in the Underground cable is located to rectify the fault efficiently Using simple concepts of Ohm's law. The work automatically Displays the phase, distance and time of occurrence of fault .The benefits of accurate location of fault are fast repair To revive back the power system, it improves the system ,performance, and it reduces the Operating expense and the time and to locate the faults in the field.

3. HARDWARE REQUIREMENT

- Step down transformer
- ESP8266 Wi-Fi model
- ATmega 16 microcontroller
- 16*2 LCD display
- Voltage regulator
- Filter
- Diode
- Relay

4. CONCLUSIONS

From this literature survey we have seen lots of technology that help to farmer for to detect underground faults. The short circuit fault at a particular distance in the Underground cable is located to rectify the Fault efficiently Using simple concepts of Ohm's law. The work automatically Displays the phase, Distance and time of occurrence



of fault .The benefits of accurate location of fault are fast repair To revive back the power system, it improves the system ,performance, and it reduces the Operating expense and the time and to locate the faults in the field ..In this paper we detect the fault in the underground cable by Using IOT technology. For this we use a simple concept of Ohm's law.

5. REFERENCES

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