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ijirset@gmail.com

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Overview of IOT Based Underground Cable Fault Detector

Kunal R. Amrute^[1], Mayuri R. Berad^[2], Pooja Konge^[3], Yatish Lohe^[4], Vivek.N.Mahawadiwar^[5]

Student, Department of Electronics Engineering, K.D.K. College of Engineering, Nagpur, India^{[1],[2],[3],[4]}

Professor & HOD, Department of Electronics Engineering, K.D.K. College of Engineering, Nagpur, India^[5]

ABSTRACT :-Underground television system may be a common followed in major areas in railway system cities. Whereas a fault happens for a few reason, atThat time the fixing method associated with actual cable is tough thanks to exact unknown location of the fault within the cable. This IOT Technology is employed to seek out the precise location of the fault associate degree to send knowledge in graphical format to our web site victimization an IOT Module at a similar time it show on the liquid crystal display screen. This paper uses the quality theory of Ohms law, i.e., once a coffee DC Voltage is applied at the feeder finish through a series resistance (Cable lines), then this would vary relying upon the placement of the fault within the cable because the resistance is proportional to the space. Just in case there's a brief circuit (Line to Ground), The voltage across series resistors changes in step with the resistance that changes with distance.

KEYWORDS: underground cable system ,IOT technology, ohm's law ,Atmega 32microcontroller.

I. INTRODUCTION

The underground cable television service may be a common follow followed in urban areas. Whereas a fault happens for a few reason, at that point the repairing method associated with that exact cable is troublesome because of not knowing the precise location of the cable fault. The projected system is to search out the precise location of the fault. The project uses the quality thought of Ohms law i.e., once a coffee DC voltage is applied at the feeder finish through a series electrical device (Cable lines), then current would vary relying upon the situation of fault within the cable. Just in case there's a brief circuit(Line to Ground), the voltage across series resistors changes consequently, that is then associate degree ADC to develop precise digital information that the programmed microcontroller of 8051 family would show in kilometers .we projected the system that detects the exact location of the fault and thru the suggests that of IOT it's serially communicated towards server. Through previous researches several techniques came up that were helpful to beat the matter up to some extent. In one in every of the paper by K.Hasan, says that-failure and degrading of air craft wiring may be a massive concern that might any cause hearth and smoke due to arcing .But the projected technique supported TDR, within which train of pulses square measure generated so as to notice the fault.

Fault can be classified as two groups:

1.Electrical circuit fault: electrical circuit faults are higher than short fault, as a result of once this fault happens current flows Through cable becomes zero. this kind of fault is caused by Break in conducting path. Such faults occur once one or additional section conductors break.

2.short fault: additional short fault will be classified in 2 types

- **Symmetricalfault:** Three-phase fault is named symmetrical Fault. during this all 3 phases are short circuited.
- **Unsymmetrical fault:** during this fault magnitude of current isn't equal→ displaced by one hundred twenty degree

Fault location methods can be Classified as:

1)Online methodology: This method utilize method the sampled Voltages& current to work out the fault points. on-line methodology For underground cable is a smaller amo~~the~~unt than overhead lines.

2) Offline methodology: during this method special instrument is employed to check out service of cable within the field. during this methodology fault purpose is detected by Walking on the cable lines. Fault purpose is indicated from audible signal or magnetic attraction signal .It is wont to pinpoint Fault location terribly accurately.



II. METHODOLOGY

Frequent fault in underground cable because of adverse whether or not condition like serious rain falls, snow or because of chemical action and most underground faults ar situated by unearthing the whole length of cable to modify visual scrutiny to be distributed .The analysis work can facilitate identification and site of underground cable fault while not unearthing the whole length of cable victimization IOT technology.

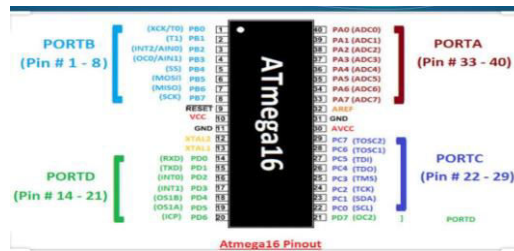
About IOT technology:

IOT technology use for electronic ,electrical and mechanical systems in homes and buildings so as to boost convenience and safety .The analysis of IOT within the electronic and electric power trade remodeled the method things performed in usual manner It increase the employment of wireless communication .The aim of IOT isn't simply solely connecting things like machines, device and appliances however additionally permitting the items to speak ,exchange management knowledge and alternative info whereas execution application.

The system style with chiefly elements like

Atmega microcontroller ,relay driver ,LCD show ,wifi module ,transform

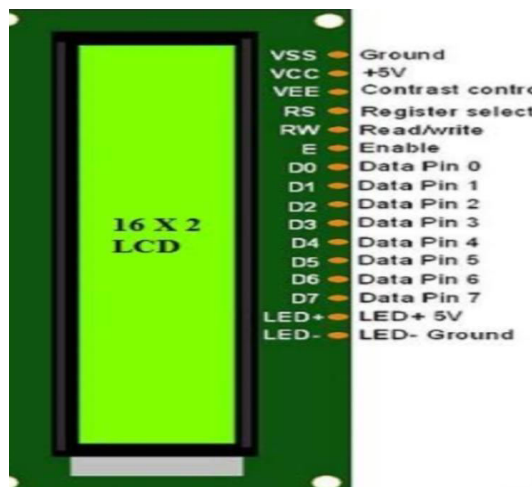
1. Atmega microcontroller:



ATmega16 is AN 8-bit high performance microcontroller from the Atmel’s Mega AVR family. Atmega16 may be a forty pin microcontroller

Supported increased reduced instruction set computer architecture} (Reduced Instruction Set Computing) architecture with 131 powerful directions. It’s a sixteenKB programmable non-volatile storage, static RAM of one KB and EEPROM of 512 Bytes.

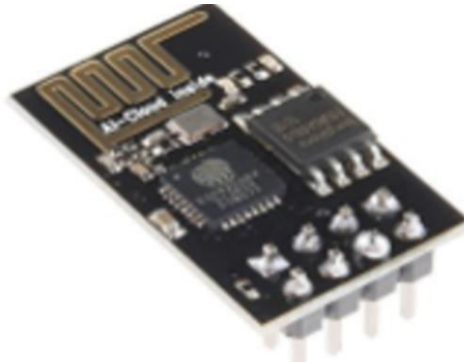
2. LCD display (16*2):



An LCD is an electronic display module and has wide range of applications as compare to LED’s. A 16*2 LCD display is very basic module and is very commonly used in various device and circuits.

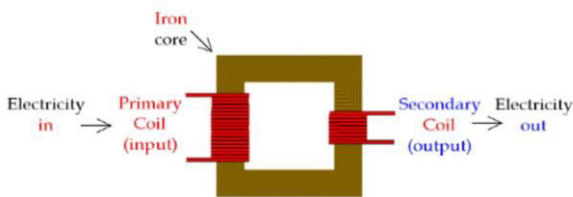


3.wifi module (ESP8266):



The ESP8266 is a low-cost Wi-Fi microchip, with a full TCP/IP stack and miHere we used step down transformer which is use to convert electrical energy into mechanical energy from one circuit to another.it help to convert high primary voltage to low secondary voltage.

4.Step down Transformer:



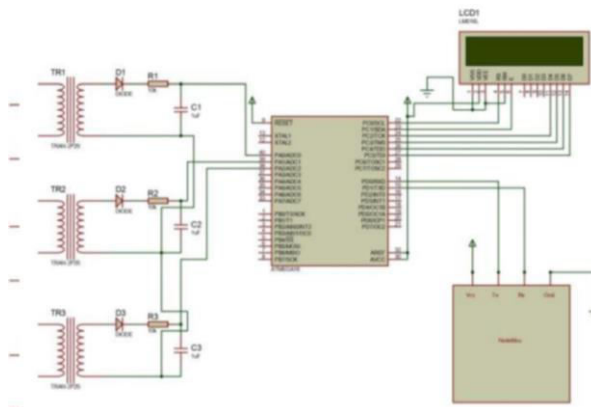
we used step down transformer which is use to convert electrical energy into mechanical energy from one circuit to another.it help to convert high primary voltage to low secondary voltage.

5.Relay:

Relay are switches that open and closed circuit electronically.Relays are control one electrical circuit by using openings and closing contact in another circuit.

III. IMPLEMENTATION

Fig.BlockDiagram



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. 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 matter came up is the way to discover fault in cable wire. Circuit diagram shows the operating of project.

IV. OBSERVATION AND RESULTS

The tangency fault at a specific distance within the Underground cable is found to rectify the fault with efficiency victimisation straightforward ideas of Ohms law. The work mechanically Displays the section,distance and time of prevalence of fault .The benefits of correct location of fault area unit quick repair To revive back the facility system, it improves the system ,performance, and it reduces the overhead and also the time and to find the faults within the field.

Single phase faults:

Input signal		Output
On phase	Off phase	Faults
R	Y and B	Single phase R faults
Y	R and B	Single phaseY faults
B	R and Y	Single phase B faults

Line to line faults:

Input signal		Output
On phase	Off phase	Faults
R andY	B	Line to line=RY
Y and B	R	Line to line=YB
B and R	Y	Line to line=BR

Three phase faults:

Input signal		Output
On phase	Off phase	Faults
R ,Y and B phase together	---	3 phase fault or earth fault

Neutral or no faults:

Input signal		Output
On phase	Off phase	Faults
---	R,Y and B phase together	Neutral or no faults

V.CONCLUSION

The contact fault at a specific distance within the Underground cable is found to rectify the Fault with efficiency exploitation easy ideas of Ohms law.The work mechanically Displays the section, Distance and time of prevalence of fault .The benefits of correct location of fault area unit quick repair To revive back the facility



system, it improves the system performance, and it reduces the expense and therefore the time and to find the faults within the field. In this paper we tend to discover the fault within the underground cable by exploitation IOT technology. For this we tend to use a straightforward conception of Ohm's law. The work mechanically displays the section, Distance and time of prevalence of fault by exploitation ESP8266 LAN module in a very webpage. It cut back the expense and therefore the time to find the faults within the field and it's believed that This model is promising technology to resolve future fault Location detection downside.

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