



IOT BASED UNDERGROUND FAULT DISTANCE LOCATOR

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ABSTRACT

In this paper the underground cable are determined the distance of the fault from the base station in kilometer using microcontroller and display through the internet. Now a days underground cable system is commonly fallowed in major areas such as Metro cites. For sum reasons fault is occurs such as weather changes like snow heavy rain lightning at this time it is difficult to detect the location where the fault occur in cable. IOT technology used to detect the exact fault location and is shown graphical format using IOT module At this instant it show in the LCD screen This paper is mainly depends on Ohm's law that is through a series resistor. If load DC voltage is applied at the starting, then the current varies which is depends on the location of the fault in the cable and in this resistors the fault is proportional to distance of fault. If short circuit occurs voltage in series resistor also varies due to change in distance.

KEY WORDS: Underground cable, Fault detection, Fault location, IOT technology

1. INTRODUCTION

Now a days underground cables are widely used for distribution network due to the advantages of underground connection involve security than overhead lines in bad weather such as snow, heavy rainfall as well as pollution But when any fault occurs in the cable then it is very difficult to locate the fault so for that we will move to find the exact location of fault Now the world is become digitalized so for in this project we detect the fault using digital way.

1.1 Representation of faults in cable:

- Inconsistency
- Weakness that effect cable performance
- Any defect
- Current is diverted in the intended path
- Insulation is failure due to braking of conductor

1.2 Fault in cable can be classified in two types:

1) Open circuit fault

As compare to short circuit fault this fault is better because when fault occurs current through cable becomes zero. This fault occur when the conducting path is break, the open circuit fault can detect by combine by measuring resistance between each conductors and earth.

2) Short circuit fault

In multicore cable, when two conductors are electrically contact with each other due to insulation failure then it is referred as short circuit fault. Short circuit fault can be grouped into two, they are

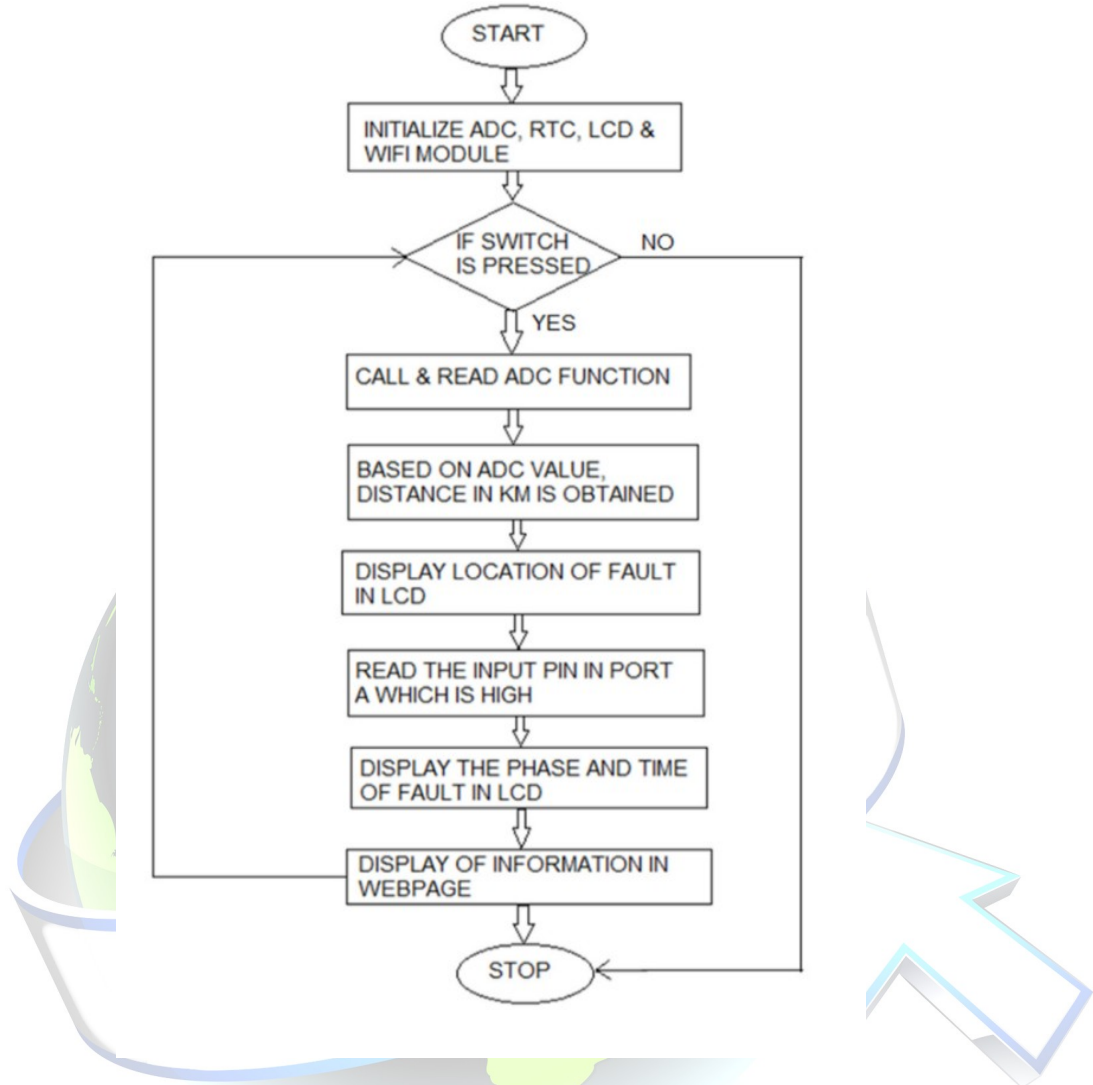
a) Symmetrical Fault

Three phase fault is called symmetrical fault. In this fault all three phases are shorted.

b) Un Symmetrical Fault

In this fault magnitude of current is not equal and not displaced by 120degree.

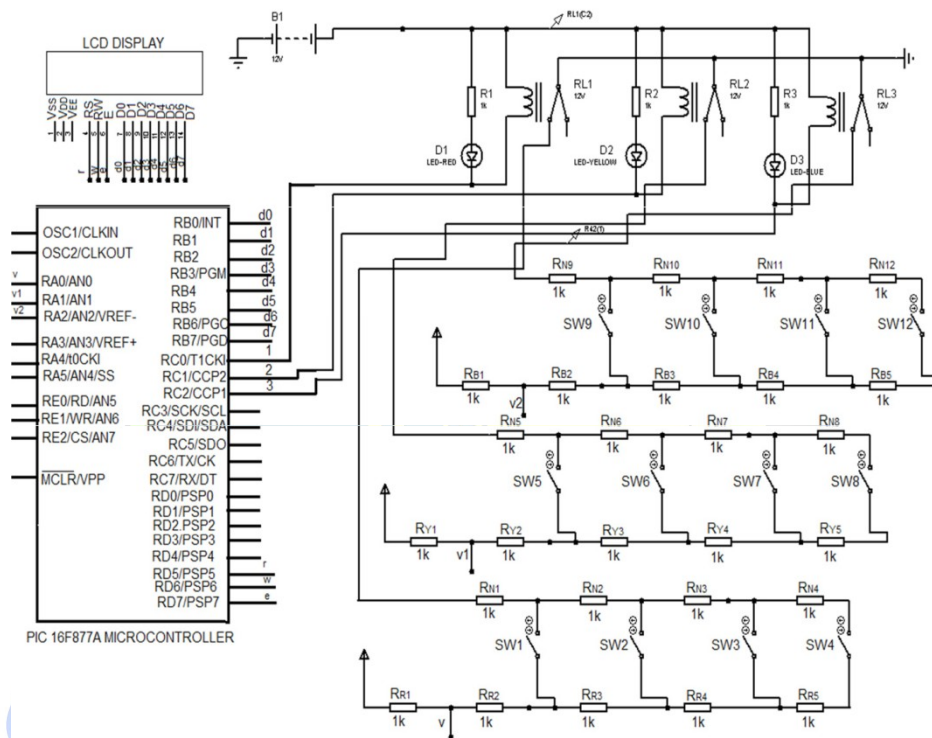
2. FLOW CHART



2.1 Algorithm:

- Step 1: Initialize the function like ADC LCD declare timer
- Step 2: By using pin 0.0 high turn on the relay 1
- Step 3: Starting line in LCD, display 'R'
- Step 4: Fault position is displayed depending upon ADC output
- Step 5: Call relay
- Step 6: For other two phases repeat steps from 3 to 5

3. CIRCUIT DIAGRAM



Sl.No.	Switch	Analog	Fault	ADC
1.	SW1	3.33 V	1 km	682
2.	SW2	3.99 V	2 km	818
3.	SW3	4.28 V	4 km	876
4	SW4	4.4 V	8 km	909

TableMappingTable forFaultIdentification

4. WORKING

Here we are using the resistors to represent the cable length. The resistors form RR1 to RR5, RY1 to RY5 and RB1 to RB5 represents the R, Y and B phases of the cable respectively and from RN1 to RN12 represents the neutral lines. Here we use switches in underground cable because if any fault occurs in the cable the switches will represent. In this we are using relays, each phase is connected to the relay which is connected to the Port C of Microcontroller and also Real Time clock is connected to the Port C of microcontroller. The LCD is connected to each relay; it will glow when the fault occurs.

When a switch is connected to a particular phase is closed, the LED which is connected to that phase will glow and the resistor which is connected to that phase will add up and voltage drop will occur and the generated will be given to Port A of the Microcontroller.

As per the above table the voltage drop will converted into distance and displayed in LCD.

5. CONCLUSION



By using the concept of Ohm's law we can locate the fault efficiency which rectify in the underground cable at a particular distance especially in short circuit fault. Here in this, module is automatically displayed the distance fault location time of occurrence of fault and the phase with help of corresponding diagram. In this project we can easily detect the fault location, fast repair and also reduce the time & cost.

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