FAULT DETECTION IN TRANSMISSION LINE USING ARDUINO UNO

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ABSTRACT

The power system is divided in three section like generation, distribution and Transmission. Various types of fault is occur in this system it should isolate. In this module we include the Arduino UNO, ULN2003, Relay to drive the relay, Resistor, LCD display, Moving switches to create fault. As per the Programming of Arduino UNO when we create the fault across any line LCD displayed the output as ,"Fault occurred in that particular line(i.e. R,Y,B) at the distance(1km,2km,3km,4km)". The output which shows displayed on the LCD display is depends on where we create a fault and in which line.

I.   INTRODUCTION

In now days the electricity is very important in our life. In the power system there are various types of fault occurs due to the natural calamity (like Lightning, collision of branches of trees with the transmission line), overloading. Due to this short circuit or fault may occurs like (line to line, line to ground, line to line to line). Out of these line to line to line fault is more savior in the power system which could damage the electrical equipment. So this fault should be remove as soon as possible. Mostly line to ground fault is occurred about the 80% in the power system. It is the biggest task for Electrical Engineer's to find the exact location of the fault so can remove it early and provide continuous supply to the consumer. So fault may be identified by designing of the programmable software which would be installed in the Arduino UNO. It will shows the exact location of the fault and types of fault.

II.   METHODOLOGY

First of all make a code and install it in Arduino UNO. As per the code the module will operate. It Detects the Line to Line fault. Using resistor three transmission line created. And 4 moving switches per phase are used to create fault. And for that code is written as if Fault is occurred due to 1st moving switch in R phase then LCD will display the fault at 1km is occurred in R and Y phase. If there will be no fault the LCD will display the NF (i.e. No Fault) And for R,Y,B phase red ,yellow, blue LED (5mm) is used respectively. The circuit diagram is shown below.

Circuit diagram:
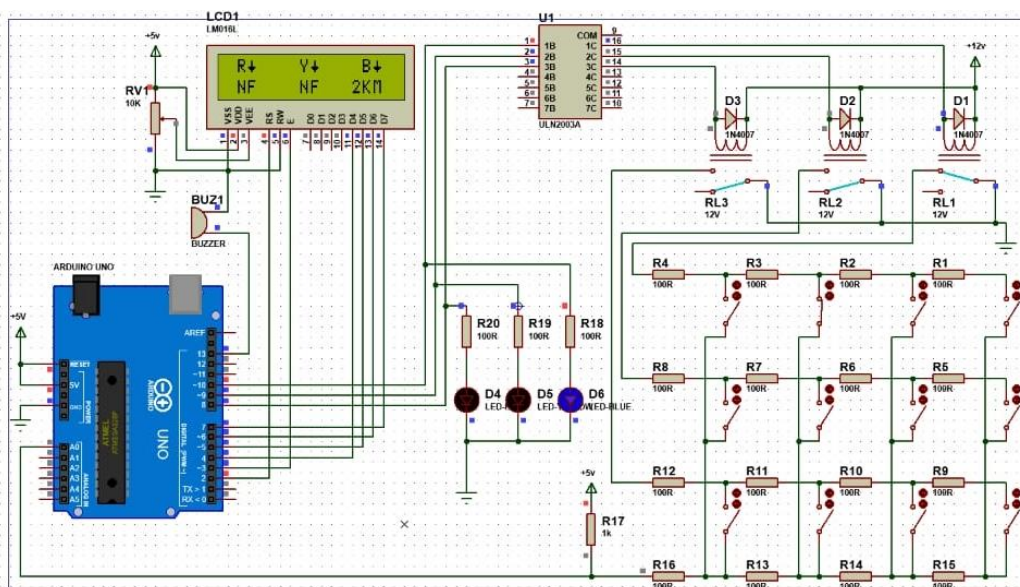
III.   MODELING AND ANALYSIS

Components Used :

Sr no.	Component Name	Rating	Quantity
1	Arduino UNO	12 V DC	1
2	Power Adapter	12 V	1
3	Resistor	100 ohm	19
4	Resistor	1K ohm	1
5	ULN 2003	-	1
6	Potentiometer	10K ohm	1
7	Slide Switch	-	12
8	Buzzer	12 V	1
9	LED (Blue , Red , Yellow) 5mm	5V	3
10	16 pin IC base	-	1
11	LCD display (16cm x 2cm)	12 V	1
12	I2C module	12 V	1
12	Veroboard (20cm x 12cm)	-	2
13	5 Pin relay	12 V	3
14	Male And Female Header	-	2

Circuit Diagram :
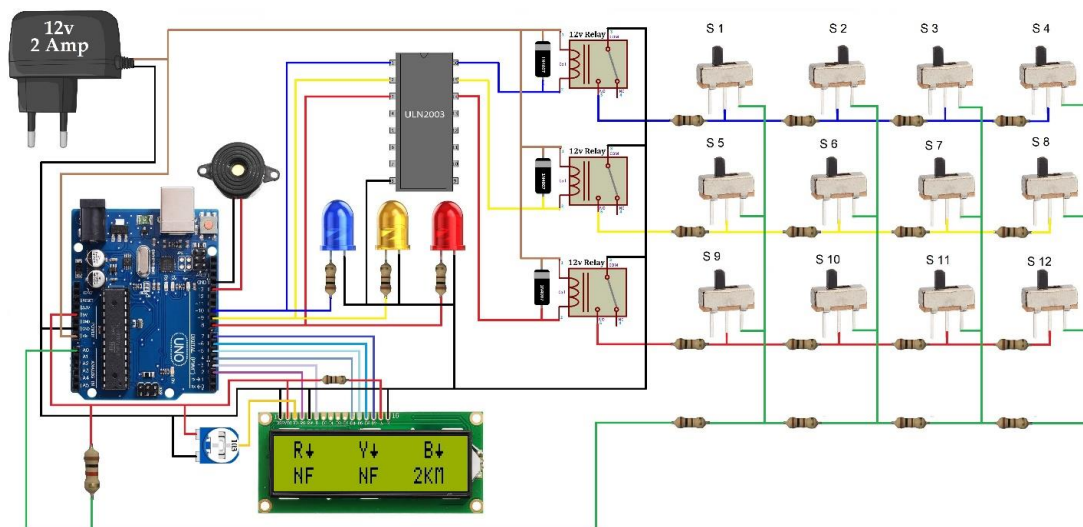
Model :

IV.   RESULTS AND DISCUSSION

Result:

Fault may be detected and removed early by knowing the exact location of the fault. By designing the programmable software which would be installed in the Arduino UNO. It will be shows the output on the LCD display including the location of the fault. Fault will be line to line. The arrangements of the component is as shown in the circuit diagram.

The result is obtained by Creating Fault Across Slide Switch. Slide Switch Numbering is as shown in Circuit Diagram.

Sr no.	Slide Switch number	Output		
1	4	R↓ 4KM	Y↓ 4KM	B↓ NF
2	7	R↓ 3KM	Y↓ NF	B↓ 3KM
3	9	R↓ NF	Y↓ 1KM	B↓ 1KM
4	12	R↓ NF	Y↓ 4KM	B↓ 4KM

V.   CONCLUSION

In now days there is the huge demand of the electricity because of all the industrial or any other work is depends on electricity. Due to this sometime overloading is occurred which affect the conductor of transmission line and electrical equipment life. Because of this situation and natural calamity fault is occurred. It should be detected early and rectify earlier to provide electricity to the consumer without any longer period interruption of power supply. Using this programmable device fault location can be detected instantly so that fault can be removed in short time period and continue the power supply by removing fault in short time period.

VI.   REFERENCES

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