

# FUSE MONITORING AND AUTO-CHANGE OVER SYSTEM

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**Abstract :** The main aim of the project is that when the fuse is blown out then a person can easily change to another fuse automatically when the indication is obtain by the circuit to a person. Thus a person can easily change the switch and continuity of supply is obtained. Also a person is avoided from getting shock while changing the fuse.. It will also help in industries to maintain the continuity of the supply. We used Arduino uno for automation purpose. Relays are used for sensing the fault current. Red and green lights are used for indication purpose. Buzzer is also used for purpose of indication when the fuse is blown out. fuses area unit used for the bar of home appliances from the short and injury by overload or high current etc. If we have a tendency to don't use fuses, electrical faults occur in the wiring and it burns the wire and electric appliances and may starts fire at home. The lives of television, computers, radios and other home appliances may also put at risk. When the fuse goes, a sudden spark occurs which may lead to turning your home into sudden darkness by disconnecting the power supply which saves any further mishappenings. That's why we want fuses to guard our home appliances from damage.

**Index Terms - Automation, fuses, Arduino Uno, Relays, Red and green light, Buzzer.**

## I. INTRODUCTION

The main aim of the project is that when the fuse is blown out then a person can easily change to one fuse to another one automatically. Fuses are used for the prevention of home appliances from the short circuit and damage by overload or high current etc. If we don't use fuses, electrical faults occur in the wiring and it burns the wire and electric appliances and may starts fire at home. The lives of television, computers, radios and other home appliances may also put at risk. Now a days in industries, when the supply is cut off due to fault then its affect the economical condition of the industry and country also. So to avoid this situation we developed the fuse monitoring auto change over system kit which monitors the supply when the supply is cut off due to overloading then it will change to another fuse automatically. Hence there will be continuity of supply in the industry and hence there will be no economical harm to the industry. Also we can use this kit for the farmers for farming purpose. We used the arduino Uno for the automatic operation of the system. We used buzzer, red light, green light, ammeter, voltmeter and timer in indication panel. We used relays for fault sensing purpose. We used bulbs as a resistive load.

## II. PROPOSED SYSTEM



Fig no.1: Block Diagram

**TRANSFORMER:-**we give 230 volt single phase ac supply to a transformer which converts 230volts in to 12volt ac supply.12 volts supply is given to the voltage regulator. Here we are using step down transformer



Fig No.2 Transformer

**VOLTAGE REGULATOR:** - 7805 is a voltage regulator integrated circuit. It is a member of 78xx series of mounted linear transformer ICs. The voltage supply in a very circuit could have fluctuations and wouldn't provide the mounted voltage output. The transformer IC maintains the output voltage at a relentless price. Here voltage regulator is used to maintain the 12 volts supply. Then with the help of bridge rectifier we convert 12V ac to 5V dc.

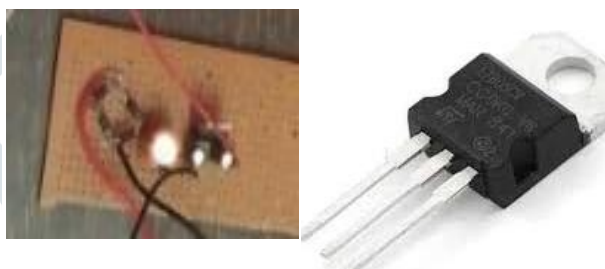


Fig No 3:- Voltage Regulator

**ARDUINO UNO:-**The Arduino Uno may be a microcontroller board supported the ATmega328 (datasheet). It has fourteen digital input/output pins (of that six may be used as PWM outputs), six analog inputs, a sixteen megacycle ceramic resonator, a USB affiliation, an influence jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to induce started. The Uno differs from all preceding boards in this it doesn't use the FTDI USB-to-serial driver chip. Instead, it options the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial device.

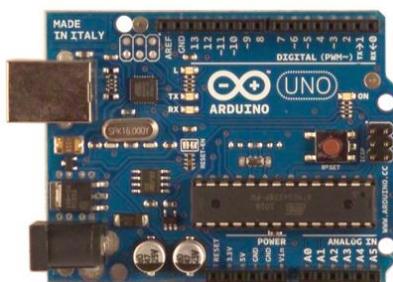


Fig No 4: Arduino Uno

**RELAY:-**Relay may be a switch that controls (open and close) circuits electromechanically. The main operation of this device is to form or break contact with the assistance of a proof with none human involvement so as to change it ON or OFF. It is primarily accustomed management a high steam-powered circuit employing a low power signal. Relay gives trip signal to red light and buzzer when the fuse is blown out.



Fig No:-5 Relay

**FUSES:** - Fuses are the devices which protect the appliances from getting damages due to over voltage or fault current. Here we used three fuses for protection purpose and also for continuous operation of the system. If any one of the fuse is blown out then supply will shift to the next fuse and continuity of supply is obtain.

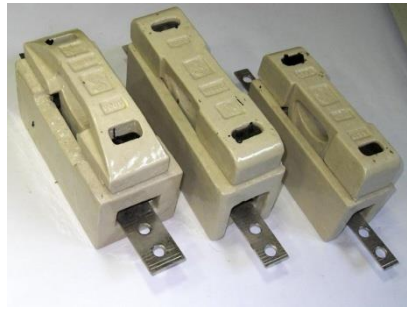


Fig No.6:- Fuse

**INDICATION PANEL:** -In indication panel we are using ammeter, voltmeter, buzzer, red light, green light, LCD display. Ammeter and voltmeter are used for measurement of current and voltage respectively green light is use when the system is healthy else red light will indicate that there is fault in the system. Buzzer will also get on when fault is occurred in the system. LCD display will start counting the time from which the system will get shut down. Also it display which transformer is on in the system.



Fig No.7:-Ammeter And Voltmeter



Fig No. 8:-Buzzer



Fig No. 9: red light and green light



Fig No. 10 LCD Display

**LOAD:**-here we are using resistive load as a load. We are using three incandescent bulbs as a resistive switch of rating 60 watts, 100 watts, and 200 watts. Here we are increasing load step by step. As loads reach to its peak then the fuse wire gets melt and the fuse shifts from one fuse to another fuse and continuity of the supply will be maintain.

### III. PROTOTYPE MODEL AND DESIGN:-

When the supply is given to transformer then 230V is converted into 12 V by step down transformer. Then this step down voltage is given to the voltage regulator to maintain a constant supply. Then this supply is converted into dc supply upto the 5 volts for the operation of the arduino uno. Arduino uno is use for the automation of the system like display time on LCD display, giving commands to the relay circuit etc. Relays are operated by the arduino. The supply is flow from relay toward fuses. The supply is now reach towards the fuses. When the system is healthy then all the fuses are in working condition with fuse no.1 is in the system. When the fault occurs in the system relay will gives signal to the buzzer and red light and both are get operated. The fuse element will melt And fuse no1 will blown out. In this situation after a second fuse no.2 comes in the circuit and continuity of the supply will be maintain. Same principle is applied for the respective fuses. In normal healthy condition the voltage and current in the system will be shown on the ammeter and voltmeter. Also green light will glow when the system is healthy. LCD display will show the time for which the fuse is blown out. Also LCD display shows which transformer or which fuse is in the circuit. Here loads are increasing gradually for melting the fuse element.



Fig No. 10 Actual View Of Project

### III. REQUIREMENT

Sr. No.	Components	Specifications	Quantity
1.	Transformer	230V/12V(6-0-6), Step-Down Transformer	3
2.	Voltage Regulator	12/5V(DC), 1.5A	3
3.	Relay	0-250V, 10A	4
4.	Ammeter	0-10A	1
5.	Voltmeter	0-500V	1
6.	LCD Display	14*2 Lcd Display	1
7.	Switch	230V, 10A	3
8.	Fuses	415 Volts 32A	3
9.	Arduino Uno	5V, 40ma	1
10.	Resistive Load(Bulb)	0-60-100-200Watts	3
11.	Buzzer	5 Volts	1
12.	Green Light	230 Volt 22 Ma	1
13.	Red Light	230 Volts 22ma	1
14.	Arduino Uno Cable	-	1
15.	Mounting Board	-	1

### IV. EXPECTED RESULT

- [1] The fuse is blown out when the power in the circuit is exceed and by the help of Arduino uno the circuit is automatically rotates to the next fuse.
- [2] The buzzer is on when the fuse is blown out.
- [3] Green light is glow when the fuse is start.
- [4] The red light is glow when the fuse is blown out.
- [5] Also LCD display shows the time for which the fuse is blown out.
- [6] Ammeter and voltmeter shows the reading of current and voltage respectively.

### V. CONCLUSION

From the fuse testing system we conclude that we can identify the rating of fuse . We also conclude that how much time the fuse will take to sustain in abnormal condition or in overload condition. Many times at the time of fuse wire changing, when fuse is blown out several time a person may get electrical show To avoid the electrical shock at the time of fuse wire replace this project is very useful just by moving the knob of selector switch. The fuse will automatically changed to another fuse and the continuity of supply take place. These kit also used in workshop for performing practical on fuse testing. The student will easily understand the experiment and there will be no tolerance in time due to use of timer and correct reading will take place.

## VI. FUTURE SCOPE

- [1] [1] It is easy to use in the industries.
- [2] It is easy for farmers for continuity of supply.
- [3] Avoid damages and human risk.

## VII. REFERENCE

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