



HIGH SPEED OVER VOLTAGE PROTECTION CIRCUIT FOR SENSITIVE LOAD

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ABSTRACT - Internet of Things (IoT) technology is bringing a revolution in the digital world after the discoveries in the field of computer and Internet. So we can use the concept of IoT technology in the power system. Today the world is moving fast towards the more effective and efficient smart grid technology by replacing the existing old technologies with the smart grid. So we can use both the technologies to make the existing power system more effective and efficient. Iot and smart grid will be a perfect blend of two technologies which will result in improvement of the existing power structure in India. In addition to that there will be many advantages of using this technology. Many existing problems that are present in the conventional power grid structure can be solved. The motive of the paper is to improve the sharing out of power in India where problems like load shedding a typical circumstance. Thick strips of copper or aluminium that conduct electricity within a switchboard, distribution board, substation, or other electrical apparatus are referred to as bus-bars in distribution of electrical power. In paper, bus bar can be safeguarded against an overcurrent situation. Overloading is one of the primary reasons of industrial instrument failures.

I. INTRODUCTION

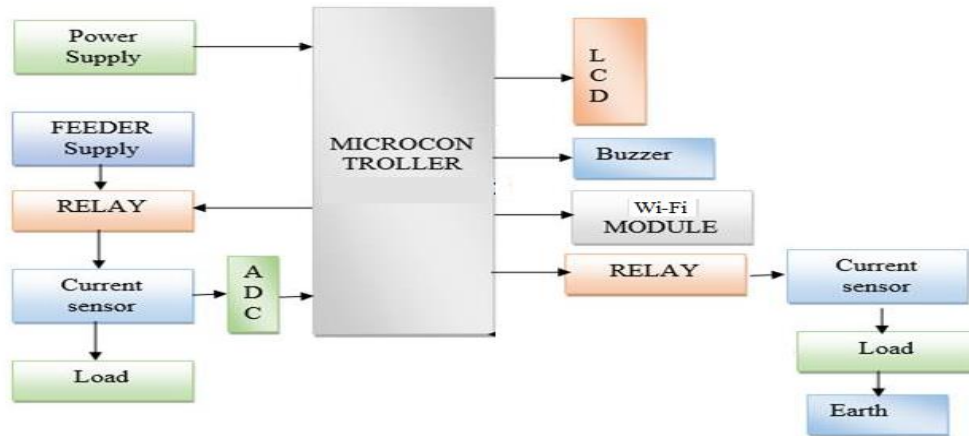


Fig.1 Electric power distribution

An automated overload protection system, used in the distribution of electric power, is a circuit breaker with a mechanism that can automatically close the breaker after it has opened result of a defect. Coordinated protection strategies for overhead line power distribution circuits use automatic overload protection systems. These circuits are prone to transitory faults such as shorting or overload. With conventional circuit breaker or fuse, a transient fault would open the breaker or blow the fuse, disabling the line until a technician could manually close the circuit breaker or replace the blown fuse. But an automatic overload protection system will make several pre-programmed attempts to re-energize the line. If the transient fault has cleared, the automatic overload protection system circuit breaker will remain closed and normal operation of the power line will resume.

1.1 DESCRIPTION

Atmega328P Microcontroller

The microcontroller acts as an intermediate agent between the voice recognition module and the motors to drive the wheelchair. It is a microcontroller board based on the ATmega328P. It has a 16 MHz quartz crystal and a reset button. It contains everything needed to support the microcontroller. It receives the input given to the Bluetooth module and converts into the format accepted by the motors and thus the motors works according to the command given. The microcontroller needs to be interfaced to the motors as well as the Bluetooth module.

Current sensor

ACS712 current sensor operates from 5V and outputs analog voltage proportional to current measured on the sensing terminals. We can simple use a microcontroller ADC to read the values.



Relay

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

LCD Display

In this system a 16x2 LCD display is used to display the current measured by the current sensor and faults occurred in the system. The display also displays which type of fault is occurred in the system.

Buzzer

The Buzzer is used to Development of warning, audio alarm during the fault occurrence and tripping in the system.

Wi-Fi Modem

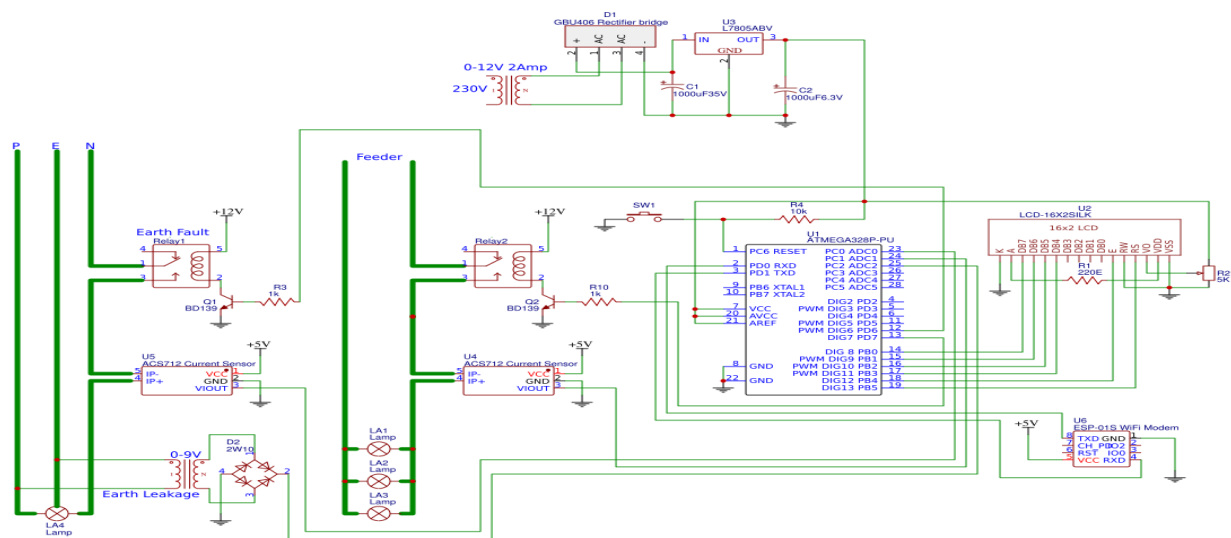
In this system we have used a Wi-Fi modem which used to send all the monitored parameters over the internet. The Wi-Fi modem sends all the data and will be display on the Blynk IoT platform application designed for this system.

1.2 WORKING

For protection of bus bar from over current condition first we have to measure the total load current which is flowing through the bus bar. Here we are using current sensor for measuring the load current and the output of this current sensor is given to ADC for converting analog output of current sensor into digital data. That ADC output is given to microcontroller for monitoring purpose. When current are increases certain limit then we are going to trip the load by using relay. In this project we are using 230v bulbs as a load. We are going to increase the load by increasing the number of loads ON. When we ON more loads it causes over load condition and microcontroller will detect that and it will trip the total load by using relay. In this project we are using 12v relay for tripping purpose. Here we are using LCD for displaying the total load current which is flowing in the circuit. Also we have used a wi-fi modem to transmit all the measured parameters i.e. load current over the internet. This data will be display on the android mobile phone of the user in which the Blynk application is installed and a project is designed in this application for this system.

An earth-fault usually involves a partial breakdown of winding insulation to earth. The resulting leakage current is considerably less than the short circuit current. The earth fault may continue for a long time and cause considerable damage before it ultimately develops into a short circuit and removed from the system under these circumstances, it is profitable to employ earth fault relay, which is essentially an over current relay of low setting and operates as soon as earth-fault or leak develops. This scheme is used for the winding of the transformer connected in star where the neutral point is either solidly earthed through impedance. The relay used is of high impedance type to meet the scheme for external fault.

II. BLOCK DIAGRAM



III. RESULTS AND CONCLUSION

In this study, we investigated a control and monitoring scheme for feeder line overload using line temperature measurements. This paper, we created a system that continuously controls and monitors the load and communicates that information to the user via a wi-fi module.

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