ISSN:2348-2079

Volume-6 Issue-1

International Journal of Intellectual Advancements and Research in Engineering Computations

Detection of voltage levels and line faults in powerlines

Mr.S.KRISHNAKUMAR[1], K.DEEPIGA[2], K.KAVI PRIYA[3], G.KEERTHANA[4], M.KIRUTHIKA[5].

Assistant professor[1] , BE Students[2,3,4,5] .

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING, K.S.R. COLLEGE OF ENGINEERING – TIRUCHENGODE.

jai.krishnakumar79@gmail.com[1],kdeepigaece@gmail.com[2],kavipriyakailasam@gmail.com[3],

keerthuharshu@gmail.com[4],kiruthiidok@gamil.com[5].

ABSTRACT- Power transmission is a major issue in electrical engineering after power generation. Fault in transmission lines is common and major problem to deal with this stream. The fault detection, classification and protection of transmission lines is proposed. The proposed system uses different protective equipments, voltage sense section, microcontroller section, LCD display section and GSM module. Faults get detected and classified according to characteristics condition of current and voltage at the occurrence of fault in three phase overhead lines. The sensed signals are given to microcontroller for detection and classification of faults. Also wireless mobile communication technique that is GSM is used simultaneously to send message to responsible person on mobile. Type of fault get displayed on fault display section.

Keywords—GSM technology, voltage sense section, microcontroller section, fault display section.

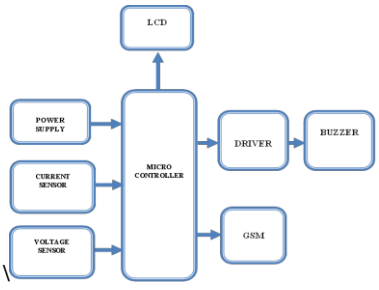


Fig: Block Diagram

I. INTRODUCTON

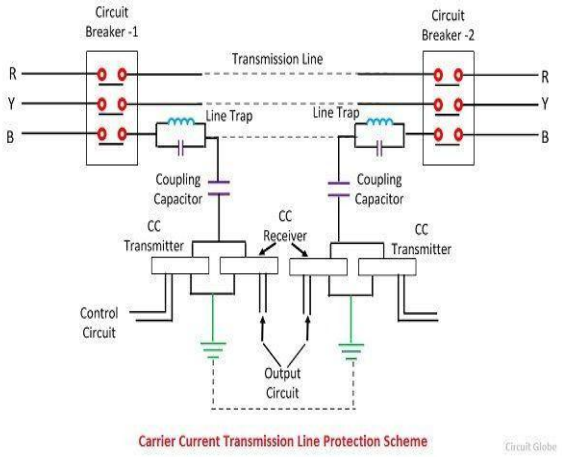
Transmission line protection is an important in power system engineering because 85-87% of power system faults are occurring in transmission lines. Under normal or safe operating conditions, the electric equipment's in a power system network operate at normal voltage and current ratings. Once the fault takes place in a circuit or device, voltage and current values deviates from their nominal ranges. Electrical networks, machines and equipment's are often subjected to various types of faults while they are in operation.when a faults,characteristics values of the machines may change from existing values to different values till the fault is cleared. The fault inception failures and conducting path failures which results short circuits and open circuits of conductors.

when a faults,characteristics values of the machines may change from existing values to different values till the fault is cleared. The fault inception failures and conducting path failures which results short circuits and open circuits of conductors.

when a faults,characteristics values of the machines may change from existing values to different values till the fault is cleared. The fault inception failures and conducting path failures which results short circuits and open circuits of conductors.

II. EXISTING SYSTEM

Usually power system networks are protected with switchgear protection equipment's such as circuit breakers and relays in order to limit the loss of services due to the electrical failures after the occurrence of fault. The design of systems to detect and interrupt power system faults is the main objective of power-system protection. There are electronics, thermomagnetic and thermal device circuit breakers. The differences lie in the tripping technologies and shutdown behavior. Characteristics curve clearly illustrate the shutdown characteristics of the various device circuit breakers. Tripping characteristics provide essential information for determining the suitability of a particular application. They indicate the operating range of current-limiting protective devices in a current/time characteristic curve. The width or tolerance of the operating range depends on the type of protective device. Conventional fuses with fuse wires are ranked among the oldest safety equipment.

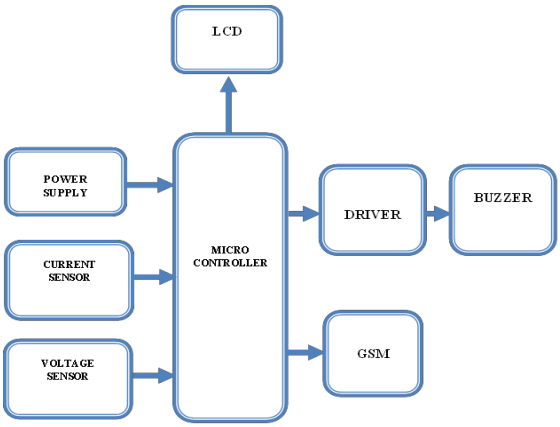


Carrier Current Transmission Line Protection Scheme

III. PROPOSED SYSTEM

The fault detection, classification and protection of transmission lines is proposed. The proposed system uses different protective equipments, voltage sense section, microcontroller section, LCD display section and GSM module. Faults like all series and shunt faults get detected and classified according to characteristics condition of current and voltage at the occurrence of fault in three phase overhead lines. The sensed signals are given to microcontroller for detection and classification of faults. Also wireless mobile communication technique that is GSM is used simultaneously to send message to responsible person on mobile. Type of fault get displayed on fault display section.

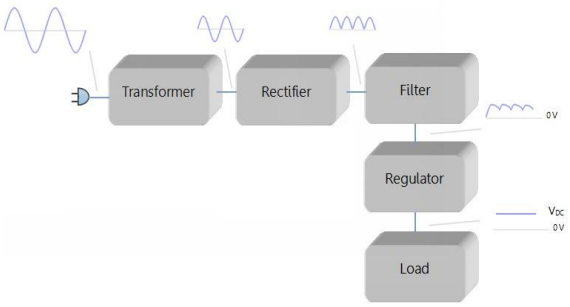
BLOCKDIAGRAM



The three phase parameter i.e. voltage of overhead line will get continuously sensed using phase voltage sense section. Once the fault takes place in overhead line,voltage and current values deviates from their normal ranges. The faults like all series and shunt faults gets detected and classified here. During occurrence of any series and shunt faults voltage gets sensed and respective signals are given to microcontroller. Relay is connected for detecting fault in fault display section. Relay is operated by microcontroller and switched after the occurrence of faulty condition. Microcontroller programming is done on the basis of characteristic condition of overhead line voltage on occurrence of fault.

IV. POWER SUPPLY

The power supply circuits built using filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage. The regulation is usually obtained from an IC voltage regulator unit, which takes a dc voltage and provides a somewhat lower dc voltage, which remains the same even if the input dc voltage varies, or the output load connected to the dc voltage changes.



Block diagram of power supply

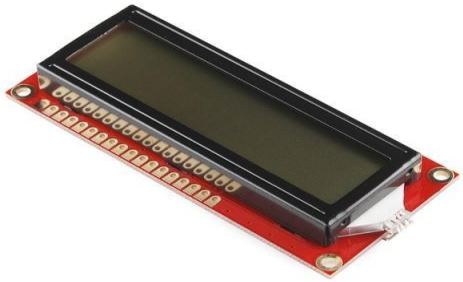
V. PIC16F877A MICROCONTROLLE DEVICE

PIC16F877 belongs to a class of 8-bit microcontrollers of RISC architecture. It has 8kb flash memory for storing a written program. Since memory made in FLASH technology can be programmed and cleared more than once, it makes this microcontroller suitable for device development. IT has data memory that needs to be saved when there is no supply. It is usually used for storing important data that must not be lost if power supply suddenly stops. For instance, one such data is an assigned temperature in temperature regulators.

VI. LCD DISPLAY

LCD(Liquid Crystal Display)

A **16x2 LCD** means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in
5x7 pixel matrix. This LCD has two registers, namely, Command and Data.



.

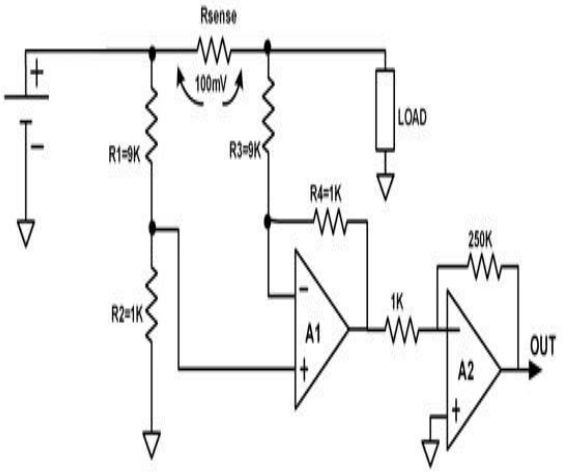
VII. RELAY:

Relays are simple switches which are operated both electrically and mechanically. Relays consist of a n electromagnet and also a set of contacts. The switching mechanism is carried out with the help of the electromagnet. There are also other operating principles for its working. But they differ according to their applications. Most of the devices have the application of relays.

VIII. CURRENT SENSOR

Measuring a voltage in any system is a "passive" activity as it can be done easily at any point in the system without affecting the system performance. However, current measurement is "intrusive" as it demands insertion of some type of sensor which introduces a risk of affecting system performance.

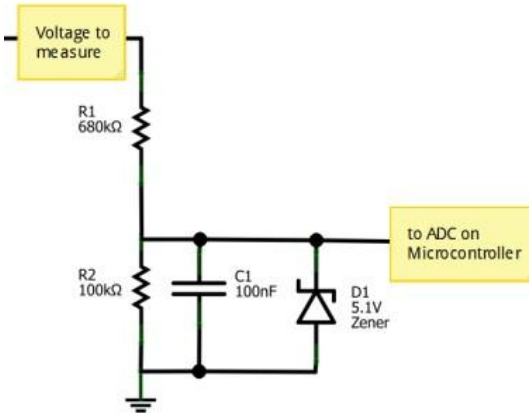
Current measurement is of vital importance in many power and instrumentation systems. Traditionally, current sensing was primarily for circuit protection and control. However, with the advancement in technology, current sensing has emerged as a method to monitor and enhance performance.



IX. VOLTAGE SENSOR

Voltage is sometimes called 'potential difference', and corresponds to the 'potential' or ability for electrons to flow around a circuit. So measuring voltage always requires direct connections to the two terminals we are trying to measure.

CIRCUIT DIAGARAM



X. BUZZER

A buzzer or beeper is an audio signaling device, which may
be mechanical, electromechanical,
or piezoelectric. Typical use of buzzers and beepers is giving sound indication to the users.

WORKING

Power is applied this mechanical device will energize and by doing so interrupt the power source and the cycle continue until the power is removed. the frequency of oscillation is strictly dependent on mechanical inertia.

XI. CONCLUSION

The implemented system design mainly concentrates on overhead electric power lines. It provides the way to detect all series and shunt fault on transmission and distribution lines. voltage of the line will get continuously sensed using phase voltage section. During the occurrence of any series and shunt fault on the three phase lime. Voltage get sensed and respective proportional signals are given to microcontroller. The type of the fault is detected by microcontroller. If the fault gets occurred wireless technology GSM (global system for mobile communication) is used to send SMS to a responsible person on mobile. Type of fault is gets displayed on fault display LED section. Simultaneously fault is get isolated using circuit breakers to provide proper protection to the overall system, especially against shunt faults.

FINAL OUTPUT

XII. REFERENCES

[1] Prashant Gautam, A.K.Jhala, "Fault Detection & Classification of 3-Phase Transmission Line", Volume 5 Issue No 1,PP 23-28,Jan 2015.

[2] Satya Prakash and S.C.Gupta, "Fuzzy Logic Based Trained Fault Locating Mechanism in Power Distribution Network", ISSN 2250-2459, Volume 2, Issue 7, July 2012.

[4] Neeta S.Sonwanel,Dr.S.D.Pable22, "Fault detection and autoline distribution system with GSM module", Interanational Research Journal of Engineering and Technology(IRJET)e-ISSN:2395-0056 Volume:03 Issue:05.

[5] P.A.Gulbhile J.R.Rana, B.T.Deshmukh, "Review for overhead line fault detection using GSM technology", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Volume 5,Issue 12,December 2016
ISSN 2278-8875

[6] C.L. Wadhwa, Electrical Power Systems, 4th ed., New Age International (P) Ltd., 2005.