# GSM TECHNOLOGY BASED FAULT DETECTION IN OVERHEAD TRANSMISSION LINE

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**Abstract**: Many electricity transmission firms across the planet are endlessly craving for ways in which to utilize trendy technologies, so as to boost dependability of power supply to customers. These transmission firms manly depends on circuit indicators (FCIs) to help in locating specific spots among their transmission lines wherever power fault had occurred. in this paper, a smart GSM based fault detection and location system was used to adequately and accurately indicate and find the precise spot wherever fault had occurred. this can guarantee a shorter time interval for technical crew to rectify these faults and therefore facilitate save transformers from injury and disasters. The system uses a current transformer, a voltage transformer, PIC 16F877 Microcontroller, RS-232 connector, and a GSM modem. The system automatically detects faults, analyses and classifies these faults and then, calculates the fault distance from the control room using an impedance-based algorithmic rule methodology. Finally the fault data is transmitted to the room. finally, the time needed to find a fault is drastically reduced, because the system mechanically and correctly provides accurate fault location data.

**Keywords:** GSM modem, impedance-based algorithm, Microcontroller, RS-232 Connector, Voltage Transformer

## INTRODUCTION

The power transmission utilities currently have the potential to remotely monitor certain mechanical and thermal characteristics of their overhead transmission lines in time period.[1] whereas electrical parameters like line currents and bus voltages have routinely been measured and communicated. open circuit and short circuit are occur because of over current, over voltage, and underneath current, underneath voltage.[2] To system operators, period line clearances, conductor temperatures, and weather knowledge like wind and solar heating in line corridors, have not. In recent years, comparatively cheap, reliable and correct instruments became commercially out there to live weather (e.g. supersonic anemometers), cable sag-tension (e.g. precision, temperature-compensated load cells), and conductor temperature. Also, comparatively low price communication ways (e.g. spread spectrum radio, etc.) are currently out there to permit remote instrument knowledge to be transmitted in period to the utility system operations centers [3]. the method of period line and weather knowledge observation on overhead lines, and therefore the calculation of dynamic line ratings (DLRs) supported it, is a superb example of a sensible “Smart Grid” application however an oddly difficult one. it's difficult as a result of maintaining adequate electrical clearances and avoiding premature conductor system aging square measure essential to the general public safety; and therefore the calculated DLRs provided to the operator should be determined with uncommon care with high instrument dependability. Our Overhead Line observation Systems (OHLMS) monitor the integrity of overhead conductors and poles accustomed distribute electricity. ascendible across huge distances, the OHLMS reduces exposure of both public and operators to danger, while improving standards of distribution performance with a quicker response to attend the location.

## TYPES OF FAULTS

Electrical faults in three-phase power grid principally classified into 2 sorts particularly open and short circuit faults. Further, these faults may be symmetrical or unsymmetrical faults.

Open circuit Faults: These faults occur as a result of the failure of 1 or additional conductors. The foremost common causes of those faults embrace joint failures of cables and overhead lines, and failure of 1 or additional part of fuse and additionally as a result of melting of a fuse or conductor in one or additional phases.

Short circuit Faults: a brief circuit may be outlined as an abnormal association of terribly low resistance between 2 points of various potential, whether or not created purposely or accidentally. These are the foremost common and severe reasonably faults, leading to the flow of abnormal high currents through the instrumentality or transmission lines. If these faults are allowed to persist even for a brief amount, it ends up in the in-depth harm to the instrumentality

## BLOCK DIAGRAM OF THE PROPOSED PROJECT WORK

In overhead lines, the fault could occur either three-phase fault or single phase fault. in this paper, we tend to analyze the prevalence of fault in single part Distribution line. The voltage can offer through the step down electrical device that is employed to step down the voltage from over head line ranges from 230V AC to induce 1V AC. Then, the rectifier permits the DC signal. The filter is employed to supply pure DC (capacitor) voltage and it'll tend to the MHz. Sag Detector acts as a limit switch to find the sag within the distribution line. Sag Detector provides message to the GSM. the entire diagram of the project is shown in Figure 1.

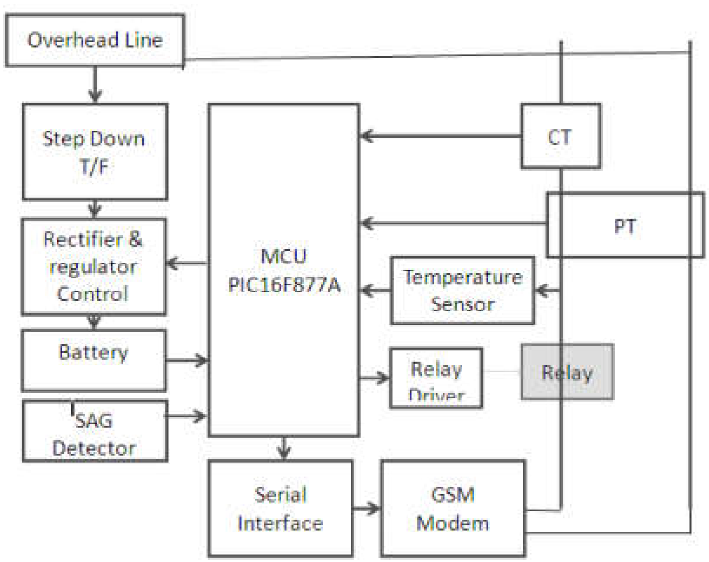



Fig.1 Block diagram

## GSM MODULE

GSM stands for Global System for Mobile Communications. Given below is a simple pictorial view of the GSM architecture. Figure 3 shows the GSM network along with the added elements.

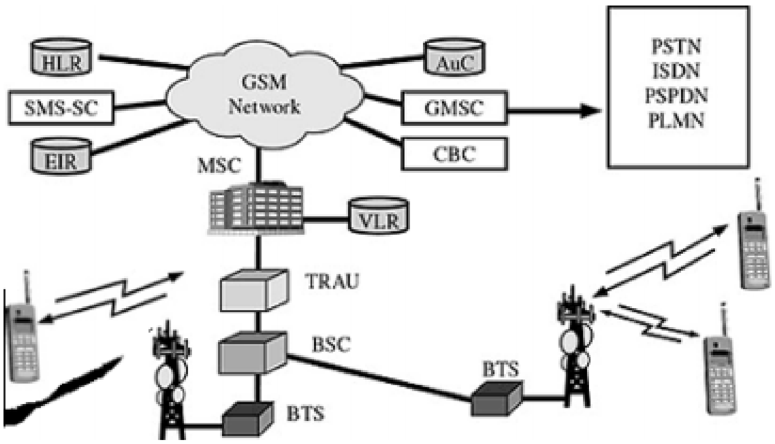



Fig.2 Pictorial view of GSM

GSM module is used to establish communication between a computer and a GSM-GPRS system. Global System for Mobile communication (GSM) is an architecture used for mobile communication in most of the countries. Global Packet Radio Service (GPRS) is an extension of GSM that enables higher data transmission rate. GSM/GPRS module consists of a GSM/GPRS modem assembled together with power supply circuit and communication interfaces (like RS-232, USB, etc.) for computer. The MODEM is the soul of such modules.

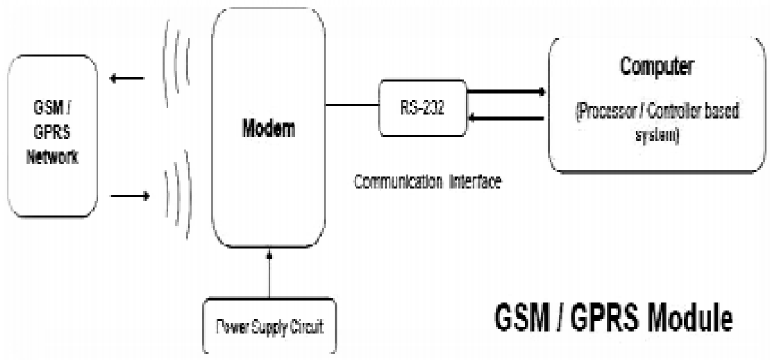
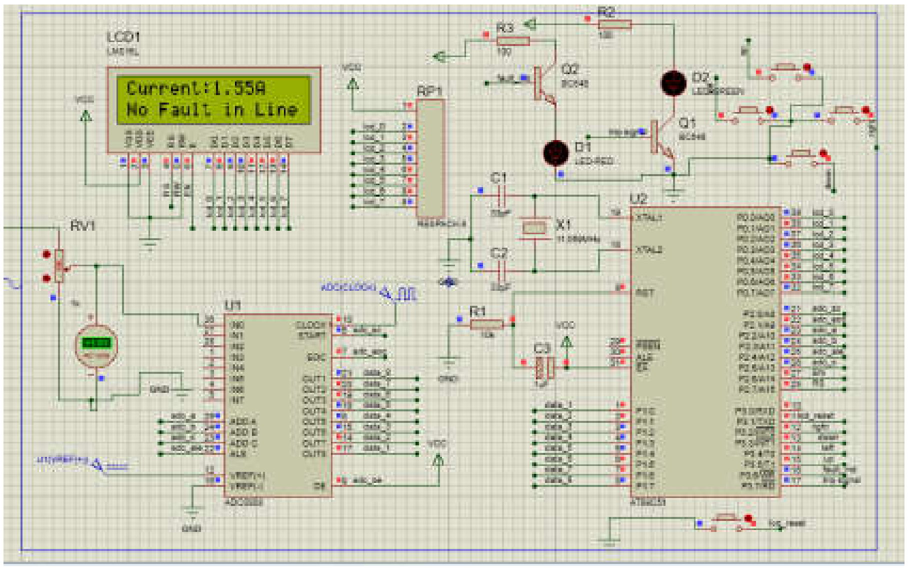


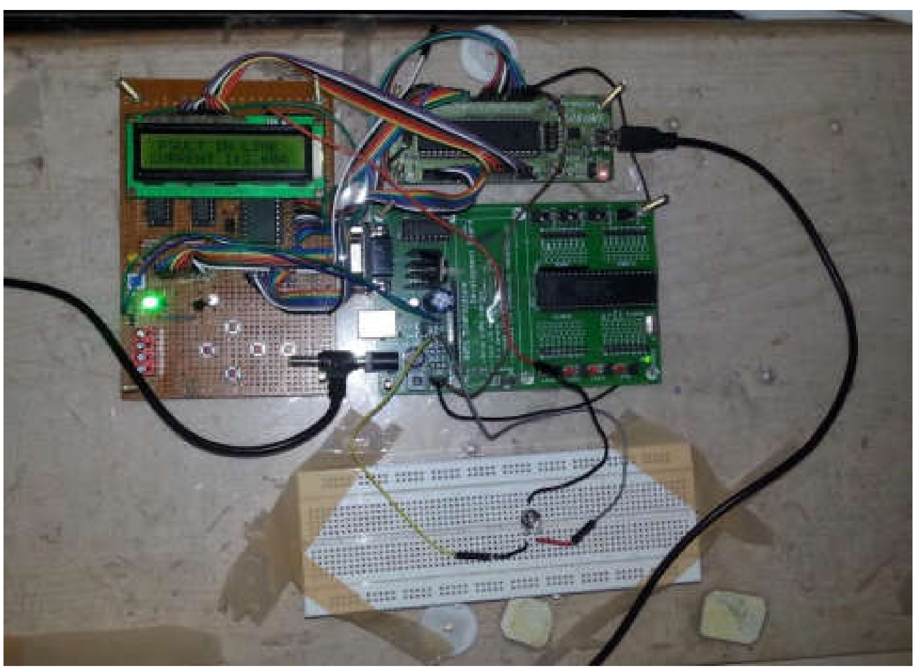

Fig.3 GSM network

## RESULT AND CONCLUSION

Simulations are done in Proteus 8. 0 and the programcode is written in KEIL uVision Software Platform.




Hardware setup of the project detecting faults using gsm technology.



The project has been completed with success and therefore the output results are verified. The results are inside the expected output. The project has been checked with each code and hardware testing tools. during this work “LCD, Microcontroller, Current transformer, Potential transformer, Temperature detector and GSM Module” are chosen to prove for additional applicable and supposed application. The project has enough avenues for future improvement. The project could be a epitome model that fulfills all the logical needs. The project with marginal enhancements is directly applicable for real-time applications. therefore the project contributes a big leap forward within the field of "Monitoring system", and additional paves a road path towards quicker developments within the same field. The project is additional adaptability towards continuous performance and peripheral up gradations. This work is applied to style of industrial and industrial applications..

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