

# Fault Detection On Distribution Lines By Using GSM Technique

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**Abstract-** This technology gives exact distance in between the distance of fault may occur that location will be provided to the calls and messages through GSM module or respective authority to clear the fault. a supply line can be affected by conditions of overvoltage and over current, also under-voltage condition. During the occurrence of any fault, the incident goes unreported for long duration. Manual reporting can lead to long outage time. To overcome this problem, a GSM based signalling system is developed that will detect the changes in voltage-current. A fault detection circuit provides visual indication and remote detection of the abnormal condition on electrical power distribution system. Whenever fault occurs on three phase line there is a need to detect the location, to reduce the patrolling time and clear the fault by communicating with area In-charge as soon as possible. This device improves communication speed which does not depend on distance. According to our survey the cost of one Distance relay is 65 times higher than our Fault detection circuit, so it is also economically beneficial.

**Keywords—**GSM Global System For Mobile Communication module, Arduino

## I- INTRODUCTION

Generally, when a fault occurs in Distribution or Transmission line, unless it is severe it is unseen. But gradually these minor faults can lead to damage of transformer. It may also initiate fire. In order to avoid such incidents to the maximum extent, maintenance or checking of the transmission lines or distribution lines

are generally carried out on a frequent basis. This leads to increased manpower requirement. In day by day increase in electricity supply requirements which increases demands on the network of power lines. This system requires reliable service to power grid. The special protection schemes that could be beneficial by using communication scheme to increase the accuracy & reliability. By using optocoupler which is act as a test circuit they may give the exact distance in between the distance of the fault without using distance relay they may give the exact specific distance of fault in between the fault occur they may identify a single-phase fault.

## A. PROPOSED METHODOLOGY

### CIRCUIT DIAGRAM

A fault detection on detection on distribution line is advice which provide visual indication and remote detection of the normal condition on electrical power distribution system the solid fault as mention can be detect by GSM module via call or messages. While patrolling of this fault it can be indicated by LED indication lamp in recent working condition impedance relay or distance relays are used to locate the fault but according our survey the cost of one distance relay is 65 times higher than our fault detection circuit, so it is also economically beneficial. In fault detection we had used main components Like GSM module, ARDUINO NANO(ATMEGHA328), voltage sensor, current sensor, optocoupler, LED Display etc.

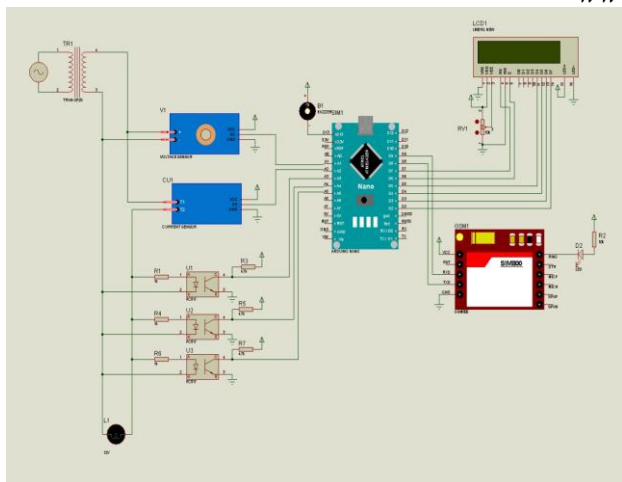


Figure 1 circuit diagram

As shown in figure basically current sensor and voltage sense are used to indicate over current and over voltage the constant value of current and voltage are fixed in ARDUINO the normal spikes in voltage and current are adjusted test circuit which is nothing but optocoupler to used locate the fault between specific region placed at particular distance which are connected LED lamps initially the LED lamps are ON when fault occurs in the distribution line the if the fault may occur in between first and second test circuit the test circuit 1 is activated and it will turned OFF automatically and ARDUINO send the instruction to GSM module to send the message or call of fault between region 1 to respective authorities to perform the further repairing work. This process is same for Region 2 and Region 3.

GSM module create message using microcontroller which read the faulty phase and location of feeder and send it to the operator, sub Engineer, junior Engineer of that location after these the operator will receive the location of fault and faulty phase and alerting calls at certain period. If that operator does not respond the clearing the fault or reset the abnormal condition to normal condition in between the periods of call. By this presses the work or clearance of fault will be done quickly with their responsibility. Also, after the fault is occurred the supply to the circuit is disconnected so the external battery source with battery charging circuit is provided to keep the fault detection circuit continuously in operation.

## II- HARDWARE DISCRIPTION

The system hardware consists of Microcontroller (Arduino ATMEGA), Current sensor, Voltage sensor, LCD, GSM module, Transformer. The figure below

shows the diagram of the whole system. The hardware construction of fault detection is illustrated.

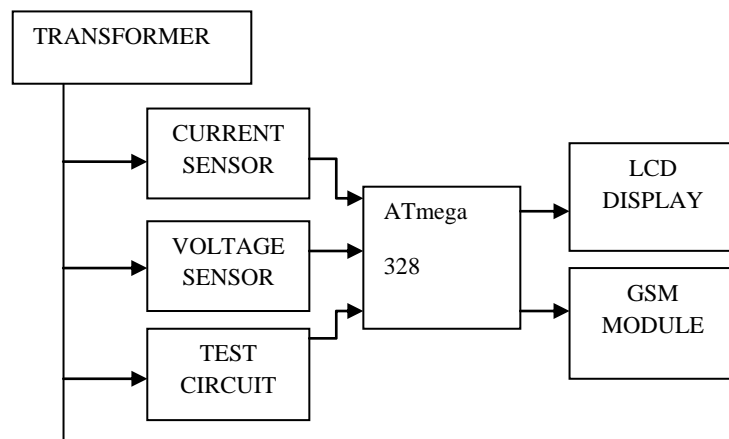


Fig.2. Schematic diagram of Fault Detection

## III. CONCLUSION

This paper concludes that the GSM technology used for the fault detection of three phase line through calls and messages is provided to the in charges of that location, by the means of communication protection schemes.

The Messages of fault location will send to the all In-charges at a same time by the internal programming of microcontroller connected to GSM Module. But the Calls at some delay will forwarded to that area In charges according to their post of working Authority.

Also, the Lamp or Buzzer can be provided if any of the area In-charge doesn't respond the clearing of fault. To get the exact faulty phase under abnormal condition has been occurred,

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