

Electrical Line Fault Detector Using Wireless Network

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Abstract-- The electrical line is spread in very long Distance to transfer the current flow to the remote areas. As the usage of current flow is increased in our nation and hence many fault and current theft is also increasing in our day to day life . In an electric power system fault is any abnormal electric current. Detecting and locating fault in power line is very necessary for healthy operation of power system. In electrical power line fault often occur many times making the power system Hence the Fault is occurred because of the Breakage of live wires and breakage due to heavy rain and snowfall and natural land slide. Hence When the fault occurs it is difficult to detect & Identify Fault location with the particular place or if any fault occurs then we need to turn off the whole area to repair the fault occur area Hence the Man power is also increased to identifying The Place of fault occurs .In this paper a novel concept is introduced that the particular place using the sensor which can sense the current flow And Arduino uno is the hardware tool used for creating the platform Sensor is interface with Arduino uno and programmed GSM module is used to send the message to the lineman with the particular location and it is designed with hardware

Keywords: Hall effect Sensor , Arduino Uno , GSM module , electrical transmission and distribution

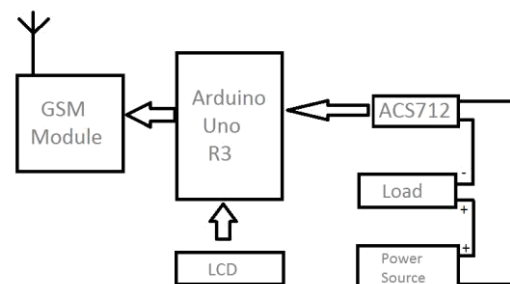
I. INTRODUCTION

The electrical line is increased now days in our country and the electrical transmission and distribution must be carried out in the lossless manner .For our current society electricity is important, and in order to properly maintain and develop power distribution system, it is needed to understand and monitor the system behaviour and also in the economical way electricity and security of smart grid, intelligent power line monitoring is important part. For that large number of sensors are required to find out the power system fault in a distributed network.. By including the number of sensor nodes, position of accuracy can be easily found. WSN are generally used to detect and locate the fault .The fault in the line is due to the breakage in the line and Snowfall , land slide, human and animal contacts the fault is occurred in the electrical line and distributed line .Still Now if any fault is created in our area

We have to find where the fault occurs in electrical line and then need to contact the electrical department to repair the fault occurs when the line man receives the intimation from the public he should identify and the repair the fault occurred area as soon as possible hence to overcome this disadvantages we have proposed a simple and cost efficient concept by using the ACS711 Hall effect sensor, Arduino Uno , GSM module . For longer distance we need to add some wireless transceiver to communicate with the GSM module .Hence when the sensor sense the flow of current in electrical line if normal condition occurs it just be idle if any fault occurs or any varying if high voltage it communicate with the Arduino Uno it will work as we command to it and it is interface with GSM module where the message with the particular location is sent to the technical man without any delay

II. BLOCK DIAGRAM

This system aims to develop the electrical line fault detector and monitoring using the wireless network where this system consist of the following components ACS712 Hall effect sensor where it sense the flow of the current and measure it and it is interfaced with the Arduino Uno where it is programmed using the Embbed C and once the fault occurred the signal from the Hall effect sensor is sent to the Arduino Uno and the Arduino Uno converts the analog signal into the digital form and the GSM(global system for mobile communication) module is used to sent the SMS(short message service) to the line man with the particular fault location and these cant be stored for the further purpose hence this system makes the live monitoring of the live electrical line. This sensor is particularly for the single phase electrical line because it can sense up to 30A current



A. Sensor

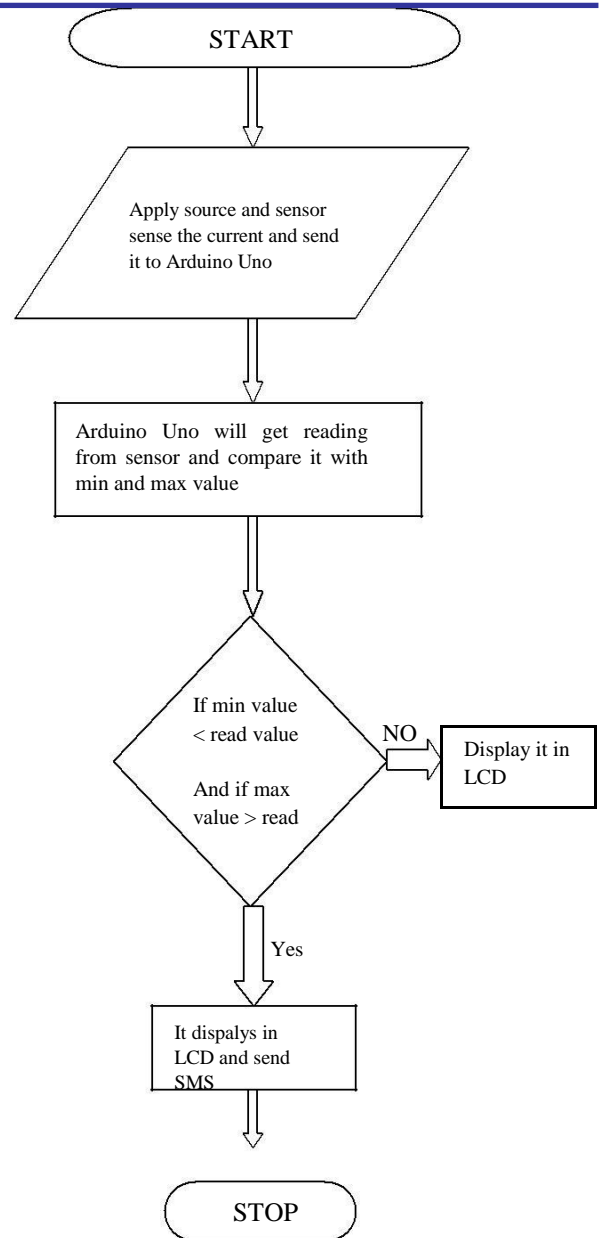
ACS712 30A Hall effect sensor is the type of sensor which is Works based on Hall effect discovered by Edwin hall in 1879 and this sensor is the bi directional sensor Which can measure the both the positive and Negative flow of current in the electrical line and this device can be used to measure the both AC and DC current the device will work in the +5V.

B. Arduino:

Arduino is the open source platform and it can be operated in any operating devices and can be programmed by Arduino IDE software which are available on their official website .Arduino uno is the simple form of the 328 microcontroller and can be programmed by our computer .Arduino can be connected to the various sensors ,switches and some desired needs Arduino Uno is operated at the voltage of of+5V and it has the both the digital and analog pins to get our desired outputs ,reset button and the USB jack to programme using our computer . Arduino can work as more than our computer is equal to the mini desk

C. GSM Module

There are various type of GSM module is Available Here we have used SIM 900A which is best suitable For the Arduino uno and the GSM module can be Sent message to the desired number which is programed using the Arduino IDE software.



III. LITERATURE REVIEW

Electricity generation, electricity transmission, electricity distribution this three terms are associated with the power grid. it present a communication infrastructure to provide low cost, reliable data delivery[1] For our existing society, electricity IS very imperative. And to accurately uphold and expand this power distribution system, it is needed to understand and monitor the system behavior. self configuration of sensor node which is comparable to DHCP, can be done. in this various types of fault is occur in transmission system single line to ground line fault, line to ground fault, line to line fault, balance three phase fault. this four fault allow to understand transmission line system[2]

From smart grid, electricity is distributed to our present society with the help of internet of things(IOT), smart grid technology is the important technical support for the generation, transmission, substation, distribution. Smart grid is based on internet of things. IOT technology is convenient of smart grid[3] cognitive radio based wireless access communication of line and substation monitoring system of smart grid is proposed in this paper. A cognitive radio based wireless access system is used for constructing the IOT for power line and substation monitoring system in smart grid. This system uses hybrid wireless communication system, such as Wi-Fi, and it is used to support the exchange and transfer of sensor information[4]

IV. MERITIS AND DEMERITIS

Quickly found out the fault location Man power is reduced

Low in cost

Can't able to detect three phase line

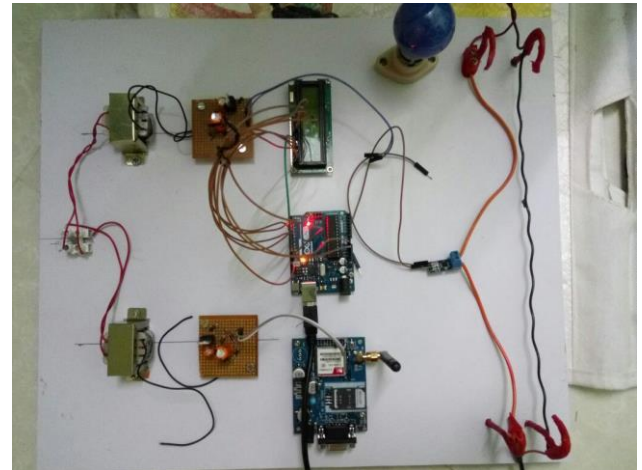
GSM module work only on getting good signal location

The fault location alone can turn off not all others

V. REFERENCE

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i. VI. RESULTS



Model Proposed System

In this figure as you can see that the Hall effect sensor and the Arduino Uno is interfaced with the GSM module and for the over voltage we have use the Bulb with less usage of current and we have created the sample transmission line to measure the flow of current

VII. CONCLUSION

The project "Electrical line fault detector using wireless network" based on the transmission line and was mainly intended to identify the fault location and monitoring the transmission line with help of this system the electrical department makes their work more easy and high value electronic machine can be maintained correctly