Detection of Fault Location in Transmission Lines

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Abstract:- **Many electricity transmission companies across the world are looking for ways to use modern technologies to improve continuity of power supply to consumers [3[. These companies mainly rely on man power for locating specific fault location on transmission lines [4]. In this paper, a smart GSM based fault location detection system will be used to adequately indicate and locate the exact spot where fault had occurred. This will ensure a shorter response time for technical crew to rectify these faults and thus helps to resume power as soon as possible.**
The system uses a current sensor, Arduino and a GSM module. The system detects fault and the fault information is transmitted to the control room or monitoring device through GSM. In conclusion, the time required to locate a fault is drastically reduced, as the system accurately provides fault location information.

General Terms:- Modern technologies, Fault information, Resuming power.

Keywords:- Transmission lines, Fault, Current sensor, Arduino, GSM.

1. INTRODUCTION

Transmission Lines are considered as the most important components in power systems connecting both generating and consumer side. Unfortunately these transmission lines are again and again subjected to wide variety of fault [1].
Thus, providing proper protection is obvious. Different types of faults are line to ground, line to line, double line to ground and three phase faults [2].
However, the most occurring type of fault is ground ones.

2. METHODOLOGY

2.1 Detection of fault using ACS 712 or hall effect sensor.
ACS 712 current sensor is connected in series with the Transmission line and it keeps monitoringthe current at every instant and the output of the current sensor increases linearly with the increase of the current flowing through it. The output of the sensor is connected to arduino. Arduino monitors the output of the sensor. When fault occurs the current through the sensor increases, so when the current reaches a certain threshold value which has been already set in the Arduino. The Arduino sends signal to the GSM module. Then GSM module sends information to the main control station. By analysing the data received from the GSM the fault location can be accurately determined.
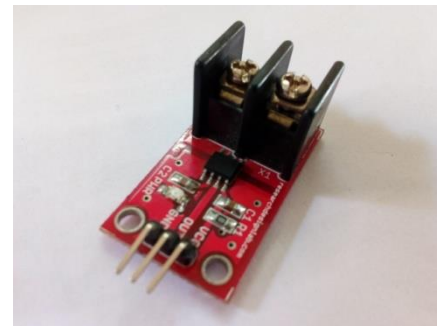

Fig.2.1 ACS 712 Sensor

Fig.2.1 shows the ACS 712 sensor which detects the current flowing through the conductor, and generates a signal equal or corresponding to that current. The generated signal can be then used for further analysis.
ACS 712 current sensor is connected in series with the Transmission line and it keeps monitoring the current at every instant. and the output of the current sensor increases linearly with increase of the current flowing through it.

2.2 ARDUINO
Arduino consists of microprocessors and controllers. This board is equipped with set of digital and analog input and output pins that may be connected to various other circuits. The board has also has serial communications interfaces, which are used for loading programs to computers. The microcontrollers are programmed using basic programming languages such as c and c++.
The sensor monitors the current with the help of arduino which is interfaced to it.

2.3 GSM
A GSM modem is a special type of device which has a SIM card slot, and can be operated or controlled from different cellphones, it is similar to a mobile phone. A GSM modem can be interfaced to arduino and when interfaced allows to communicate over the mobile network. The main purpose of GSM in this project is for sending SMS.
GSM is also interfaced with arduino, So when current reaches a certain threshold value which has been already preset in the arduino the arduino sends signal to the GSM module.
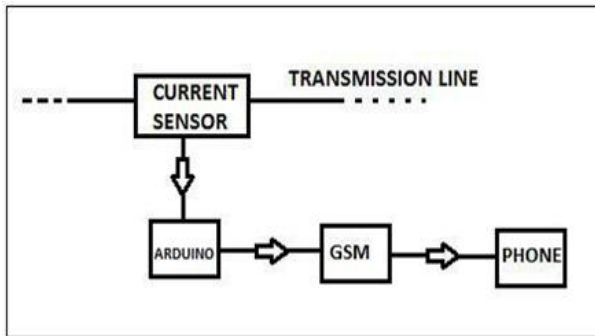
3. BLOCK DIAGRAM

Fig.3. Overall Block Diagram

As shown in Fig. 3. The sensor monitors the current with the help of Arduino. GSM is also interfaced with Arduino, So when current reaches a certain threshold value which has been already preset in the Arduino the Arduino sends signal to the GSM module.

4. COMPONENTS USED

Component	Specification	No.
ACS 712 SENSOR	20A/30A/50A depending on the type of fault	1
ARDUINO	Atmega8 Microcontroller	1
GSM	SIM 900	1
PHONE	Smart Phone	1

5. RESULT AND CONCLUSION

By applying this method the range of fault location can be determined thereby overall time for the detection and repair reduces drastically and also Arduino failure rate is found to be minimum. Hence power can be resumed with minimum time, which in turn will result in more reliable and efficient work. Thus this method is efficient for power transmission technology.

6. AKNOWLEDGEMENTS

7. REFERENCES

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