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Electric Fault Location Detector

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***Abstract*: Now a day's transmission and distribution line protection is a key problem in power transmission lines because (85-87) percentages of power system disturbances are occurring in transmission lines. Identification of fault source is a tedious task; fast fault detection can help to protect the equipment before any significant damage of the equipment. The exact fault location can help service man to remove persistent of the faults and locate the areas where the faults occur regularly, thus reducing the occurrence of fault and minimize the time of power outages. The paper is intended to detect the location of fault in distribution lines using an Arduino board and the same is transmitted to control Centre using Arduino Uno device. In this proposed thesis, we sense the current by placing the conducting wire inside the loop of the current transformer and is given to the protective circuit to avoid the high current. This is given to the Arduino Uno (microcontroller). In case there is a short circuit, the current in the series resistors modifies accordingly to the resistance that modifies with the distance and the load which is connected through a relay to the Arduino is turned OFF when the resistance is below threshold value. In addition, An LCD display will indicate the status of the distribution lines and buzzer will sound when fault is detected.**

***Keywords*: Arduino Uno R3 SMD, LCD,**

1. Introduction

The location and grouping of faults in the distribution is an important errand for shielding the framework of electrical power. A key part of the Defensive Transport is a selector module that characterizes the type of fault that has occurred as well as adjusts the typical state. Choosing a solid stage for the condemned stage is inevitably important to avoid deviating from the wrong stage or one of the additional three stumbling blocks. Also, an important prerequisite for stage selectors is rapid activity, since the selection cycle needs to end after a rapid shortfall before the breaker opens. The complexity of the mediocre step-decision planning framework model, lack of information about its boundaries, influences of the far best, defects, disorders, covalent bonds in adjacent same lines, etc. experience adverse effects of certain negative aspects Also if symptoms are suspected, settle on the right choice to strongly influence the working conditions of the framework. Remote sensed transmission line observations are state based, not conclusions, through continuous primary cardiac change, faster defect limitation, recognizable evidence and electrical fault isolation from mechanical problems. It offers answers to some concerns, such as cost savings through support. These applications, such as intermittent maintenance, show a serious need to quickly convey huge measurements of exceptionally robust information. The realization of these applications relies on a practical and robust organizational design plan with fast reaction times. Organizations should provide options for transmitting sensitive information, such as current status and control data of transmission lines between transmission grids. This paper provides an advanced structure of costs for planning an organization of continuous Information delivery. To triage the situation in the force framework, sensors are placed in different parts of the force organization. These sensors are equipped to generate large amounts of data, making detailed estimates of various physical or electrical boundaries.

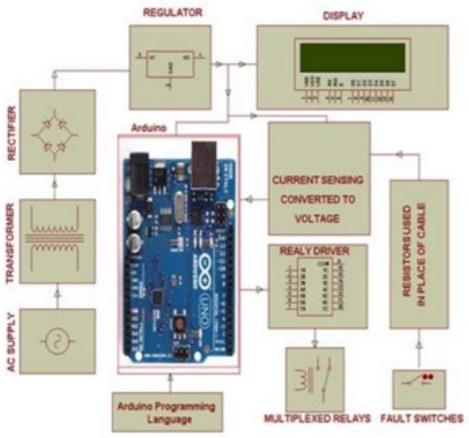

Fig. 1. Bock diagram

2. Working

We used the Rectifier to convert 230V AC to 12V Dc, we have made bridge type full wave rectifier to fine pure dc in output end of rectifier and also used 12v regulator to achieve 12v constant dc voltage in output. We used fault sensor circuits and buzzer indication circuits which connected through Arduino Uno. We used Arduino and LCD display to control all action and display data which we want to display and indicate. In this project we are using the 3 line (L-1, L-2, L-33) which are connected through rectifier circuit and fault sensor circuit. Each line we have using LED Light for load. Initially all the loads will be connected to 12v dc with line junction, we have

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use 3 junctions for each line which we can create fault in this circuit. When all Three line are loaded, the sensor will not sense any fault. Which will not give any single to Arduino, which will not give any fault single to the display and also keep the buzzer circuit off. When we disconnect any junction from the load, the load will off and fault signal will go to Arduino give signal to led to print fault and also give to buzzer circuit to indicate.

1. When will disconnect junction one Arduino print in display Electric Fault Village-1, Distance-6km with buzzer
2. When will disconnect junction two Arduino print in display Electric Fault Village- 2, Distance-5km with buzzer
3. When will disconnect junction three Arduino print in display Electric Fault Village-3, Distance-4km with buzzer.

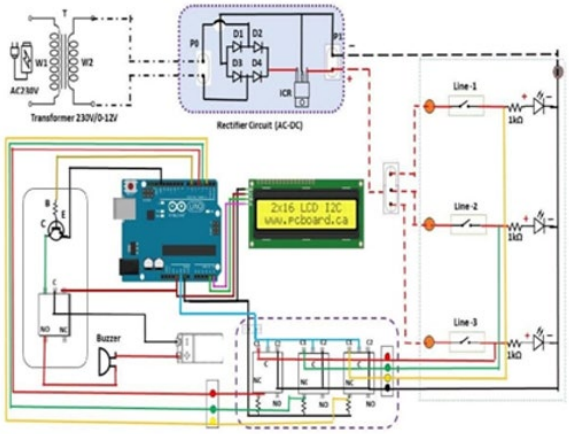

Fig. 2. Circuit diagram

A. *Advantages*

1. Work in real time response.
2. Coverage area is large compared with other existing system.
3. Cost efficient.
4. Devices are enabled by wireless communication
5. Economically reliable.
6. Numbers of components used are compact in size.
7. No need to report in substation about power off.
8. Easy to get information about electrical fault location and distance.
9. Public will not face any trouble, and their problem will solve quickly.
10. Buzzer indication will ring until and unless the department solves the electrical fault.

B. *Application*

1. Industrial areas.
2. Shopping malls.
3. Distribution and Transmission system etc.

3. Conclusion

In this project we have designed a fault deduction-based distribution system and fault raising framework that is able to send data with the equivalent to the monitor room by means of sensors. The carried-out framework configuration basically focuses on the transmission and distributing modules. It gives us the best approach to identify those faults, for example, wasting supply and power theft. This framework ceaselessly screens different boundaries of the framework. It likewise assists with distinguishing the shortcomings at the proper time and subsequently dodges illegal utilization of power. Programmed checking, examining and fault detection will be made through the LCD display over the hyper terminal. Our model has ceaseless observing modules incorporating the correspondence of innovation along with latest innovation. This likewise addresses the hardware equipment and the software process. Thus, execution of this system can save huge measures of power and in this manner, power could be accessible to huge numbers of customers on an exceptionally populated country like our country.

A. *Scope for Future Work*

1. Underground line or cable fault locating.
2. By implementing the model, we will locate unsymmetrical faults.

References

[1] E. Tsykunov, L. Labazanova, A. Tleugazy and D. Tsetserukou, "SwarmTouch: Tactile Interaction of Human with Impedance Controlled Swarm of Nano-Quadrotors," *2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Madrid, Spain, 2018, pp. 4204-4209.

[2] F. d. C. F. Guerra and W. S. Mota, "Current Transformer Model," in *IEEE Transactions on Power Delivery*, vol. 22, no. 1, pp. 187-194, Jan. 2007.

[3] Kieran M Corcoran. ―When Does the Buzzer Sound: The Nonstatutory Labor Exemption in Professional Sports. In: Colum. L. Rev. 94 (1994), p. 1045.

[4] Moe Rahnema. "Overview of the SMD system and protocol architecture."

[5] Nagarajan R, S Sathishkumar, K. Balasubramani, C. Boobalan, S. Naveen, and N Sridhar. Chopper fed speed control of DC motors using PI controller, in IOSR-Journal of Electrical and Electronics Engineering (IOSR-JEEE) 11.3 (2016), pp. 65-69.

[6] Nitin Jain, Aniruddh Dongariya, and Ajay Verma. Critical evaluation of several kinds of task scheduling systems for partnership amongst data transmission. In: 2017 international conference on information, communication, instrumentation and control (ICICIC). 2017, pp. 1-4.

[7] P. Zhang, F. Li and N. Bhatt, "Next-Generation Monitoring, Analysis, and Control for the Future Smart Control Center," in *IEEE Transactions on Smart Grid*, vol. 1, no. 2, pp. 186-192, Sept. 2010

[8] PJ Patel, DP Thakkar, LN Gupta, VB Patel, V Tripathi, NP Singh, UK Baruah, et al. AN regulated power supply for accelerator driven system. In: Proc. IAEA. 2009, pp. 1-8.