



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 11, Issue 5, May 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.118

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Fault Detection System Using Arduino

Pallavi M. Mankar^{*1}, Pratiksha F. Gondane^{*2}, Neha Rathod^{*3}, Bushan Chaware^{*4}
Darshana Kedar^{*5}, Arati lande^{*6}

Assistant Professor, Department of Electrical Engineering, PRPCEM, Amravati, Maharashtra, India^{*1}

UG Student, Department of Electrical Engineering, PRPCEM, Amravati, Maharashtra, India^{*2,3,4,5,6}

ABSTRACT: In recent times their area unit chromatic challenges within the field of installation engineering. Fault in overhead transmission lines is one of the most important problems. Fault discovery at intervals of the electric string has continually been an influential content at intervals of the capability grid as they run several kilometers across the country. The first discovery of a fault in overhead lines will broadly enhance power systems, responsibility, safety, and profitability issues. This paper helps in describing an automatic thanks to corroborating the fault in OC and informs specific authorities of that position. During this design, a tool has been introduced which might use the incoming and gregarious values to find abnormalities with the help of sensors. This paper deals with the easy construct of Ohm's law. Whenever any fault happens in transmission lines like short circuits, the resistance becomes little, and hence the present becomes too high and there is concerted a correction in voltage. The microcontroller detects the voltage changes and as per the programming, it provides fault data and displays true of the fault, and through that part, fault has passed on digital display also as on blink (Android app) with the backing of Wi-Fi Module.

KEYWORDS: Fault, Detection, Clearance system, etc.

I. INTRODUCTION

Electric power transmission lines are the veins that pump that life into the fashionable world, delivering electricity to customers at their homes, offices, and industries. It is important to make certain a smooth operation of transmission lines to deliver a minimally interrupted power offer creating necessary for reliable operation of power lines. In power transmission systems, the bulk of voltage and current signal distortions are caused by faults. Faults that occur in power transmission lines will disrupt power offers. The time needed to search out a fault is drastically reduced because the system automatically and properly provides accurate fault location info and Protection. This may ensure a shorter interval to rectify these faults and thus facilitate saving transformers, relay, and alternative equipment damage from disasters. A wise small controller-based fault location detection and Protection system were used to adequately and accurately indicate and find wherever fault had occurred. The system uses a current transformer, a voltage device, Atmega328 Microcontroller, Acs12 current device, a relay, and one Arduino (Control Unit). The system mechanically detects faults, analyses and classifies these faults then, calculates the fault distance from the world mistreatment under an impedance-based algorithmic rule methodology. The project presents the style and implementation of Protection observance and a centralized system. Overhead cables are wide enforced due to their reliability and restricted environmental considerations. To boost the reliability of a distribution system, correct identification of a faulted phase is required therefore on in the reduction the interruption time during fault. Therefore, a quick and proper fault detection methodology is required to accelerate system restoration, reduce outage time, minimize monetary losses and considerably improve the system reliability. When a fault happens on transmission lines, detection fault is very important for the grid so on clear fault before it'll increase the injury to the power system. Once any fault happens in cable, then it's tough to find fault. So, we'll move to hunt out the precise location of the fault.

II. WORKING

As you see in Figure 1 And Figure 2 there are mainly 4 units of power supply to the Arduino, a three-phase supply coming from the transformer, the fault detection controlling unit, and the relay unit which operated when a fault occurs in a system. Firstly we turn on the Arduino by giving 5v that gives a power supply to the relay and also works as a data acquisition system to compare the input different current from a different current sensor with actual value. So also 5 volt supply for the current sensor all signal pins from the current sensor is connected to the Arduino. All signal pins of the relay are connected to the Arduino so if there is any condition that occurs and Arduino sent a signal to the relay and

the relay is going to make or break the circuit. 3 phase supply that goes to the tower, and we have one artificial fault-creating circuit. We press one switch in between two phases then line to line fault occurs So at that condition the current from both the phases is changed and that sense by the current sensor and produce output that compared with the already store standard value if there is any deviation in a value that makes this particular two lines off. That is for the line-to-line fault. When the fault occurs in a three-phase and the ground at that condition all the load is disconnected from the system by using a relay unit. Suppose any line to ground fault occurs at that condition this particular phase is disconnected from the system by relay. So like this for a different fault that is line to ground triple line to ground sense by the system and the output load connection disconnection is controlled by the Arduino every time. And all these operations are sent to the LCD that is connected with the system, so anyone can monitor which fault when occurred and which line is off by the controller.

III. METHODOLOGY

This model work on the principle of OHM's law. When a bit dc voltage can be a feed at the one end of the overhead cable employing a group of resistors, then there'll be a change in currently supported by the position of fault during a cable. There are 7 switches and they are represented as fault switches these switches can create a line to line faults and line-to-ground faults. Whenever any fault occurs in-transmission lines like short circuits, the resistance becomes small, and thus this becomes too high and there's also a change in voltage. Then it's given to the ADC converter of the Arduino board and this converter generates digital data this data helps in providing the knowledge of the truth. Then the last word result's visiting be displayed on an LCD interfaced with the micro-controller. The microcontroller used is At mega 2560 which may be a High-Performance LowPowerCMOS8- Bit microcontroller that we've got also interface this project with Io-Tso whenever there's any fault occur within the conductor a message goes to be sent to the mobile number showing things of the fault and within which phase fault has occurred and it is also displayed on a blink (Android App) with the help of Wi-Fi module.

IV. RESULTS

The analysis of fault and placement in a very cable. Whether it's a kind of fault that may be detected and located. When a fault gets occurs on the cable the signal is sent to the LCD Screen And Micro Controller. The message receives on the LCD that's the fault between pole 1 and a couple of and also the fault which is symmetrical or unsymmetrical. The signal that appears on the Micro Controller will compare the condition for fault by analyzing current and voltage by the input of sensor and make the Relay operated and secure the circuit.

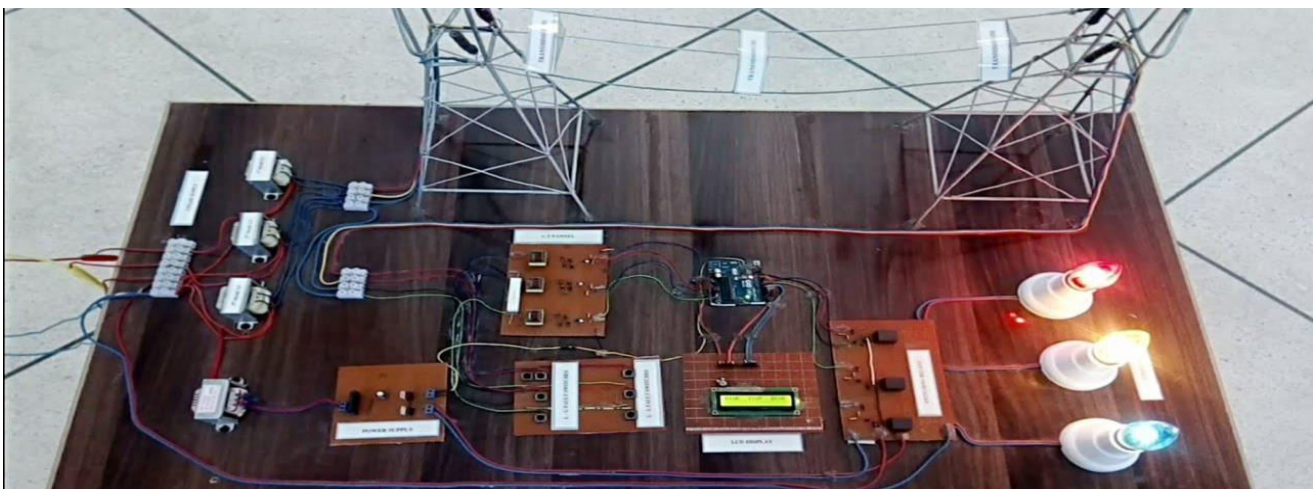


Figure 1: Result

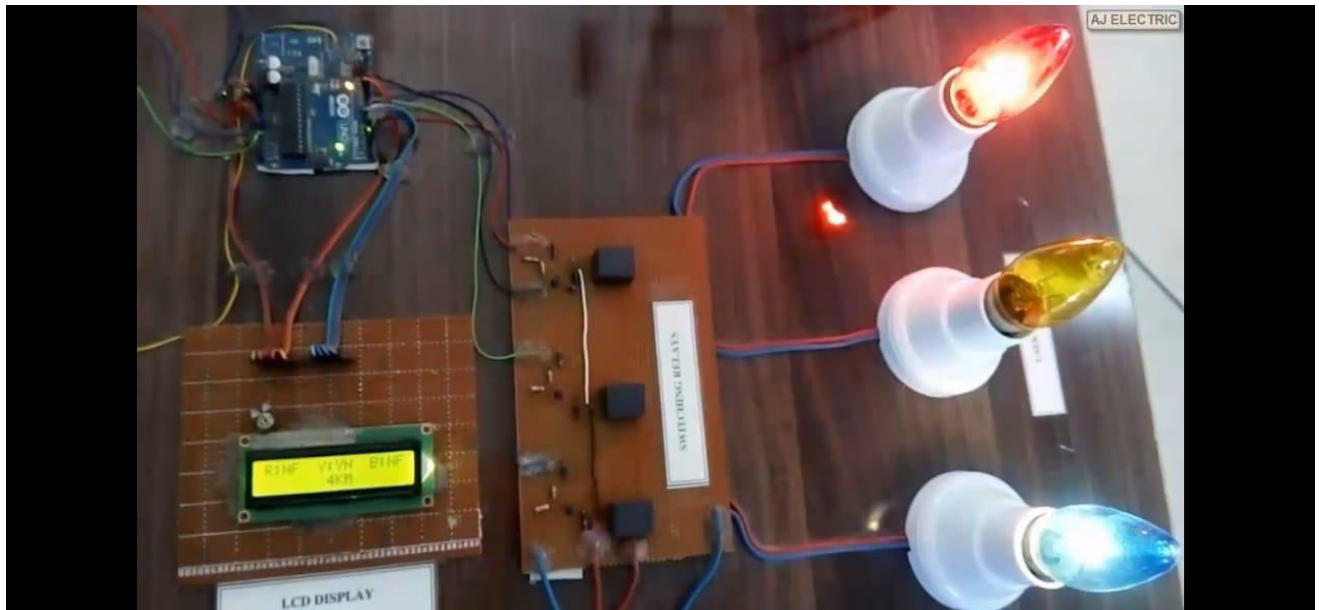


Figure 2: Result

V. CONCLUSION

Here, in this project, we have designed a transmission line for detecting the fault. A system that sends information of the same to LCD. The implemented system design mainly concentrates on the Power system. It provides the means to detecting the faults like wastage of energy and power theft, all unsymmetrical Fault. The model continuously monitors various parameters of the system. It also helps to detect the fault at an acceptable time and hence avoids illegal use of electricity. Automatic monitoring, analysis, Protection, and recording are done by the System. The project has continuous monitoring and protection system integrating the communication technology and the microcontroller technology. It also represents the hardware architecture and therefore the software flow. The implementation of the system will save the system from any kind of fault.

REFERENCES

- [1] Prof. M. S. Sujatha, Dr. M Vijay Kumar Dept of EEE. "On-line monitoring and analysis of faults in transmission and distribution lines using GSM technique", E-ISSN: 1817-3195. Vol. 33 No.2, 30th Nov, 2011.
- [2] Ms. Devjani Banerjee, Prof Dr. Mrs. N. R. Kulkarni Electrical Engineering Department. "Three Phase Parameter Data Logging and Fault Detection Using GSM Technology", ISSN 2250-3153, Volume 3, Issue 2, February 2013.
- [3] Ai-hua Dong, XinlinGeng, Yi Yang, Ying Su, Mengyao Li Henan Polytechnic University. "Overhead Line Fault Section Positioning System Based on Wireless Sensor Network", ISSN 0033-2097, R. 89 NR 3b/2013.
- [4] Shang-Wen Luan, Jen-HaoTeng, Chao-Shun Chen, Yi-Hwa Liu Department of Electrical Engineering. "Development of an Intelligent Fault Indicator for Smart Grids", IPCSIT vol.6 (2011) © (2011) IACSIT Press, Singapore.
- [5] Nikhil S Navkar, Akash T Madane, Sachin G Kalyankar Department of Electrical Engineering. "Automatic Fault Location and Monitoring on Distribution Line with MATLAB", ISSN: 2394 - 6598 Volume I, Issue 3, March 2011.
- [6] Perz, M. "A Method of Analysis of Power Line Carrier Problems of Three-PhaseLines." IEEE Transactions, Paper No. 63-937. June 1963



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.118



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 **9940 572 462**  **6381 907 438**  **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details