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Three Phase Transmission Line Fault Detection Using IOT

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ABSTRACT: If we look at the present Transmission line fault detection system, there are several problems, few of which include lack of skilled labour, increased risks and also time consuming process. Automating a process is known to solve many or all of such problems faced in the conventional processes. This is one such attempt to create an easy and cost-effective solution which is applicable in the upcoming power transmission systems for Electricity providers and operators at various stages or stations. The IOT base Transmission fault detection system can detect the fault when the line breaks down and it also shuts down the power supply through the faulty line until the operator shuts down the entire line once he confirms the fault. The system monitors the line fault in sequence for 3 lines namely R, Y, B Phases. Once if fault is detected the system sends the notification to the line monitoring station, it also provides the information about the faulty line and the distance at which the line is broken. The system is also capable of sending the line voltage to the monitoring station.

I.INTRODUCTION

It is known that when a fault occurs in overhead transmission line system then instantaneous changes in voltage and current at the point of fault generate high frequency. The fault impedance being low. The fault current is relatively high, during the fault. The Voltage become unbalanced because we have found that the Internet of Things (IOT) is a simple, yet a very powerful concept which evolved overtime. "Internet of Things" phrase which is well-known as IOT in short is created from the words "internet" and "Things" where "Things" refers to any internet connected device. IOT technology allows the physical objects to be connected to the internet and enabling the monitor and control of these objects from anywhere. The number of internet users is booming due to advancement in gadgets, computers and mobile phones therefore the IOT paradigm is proving to become a significant part of the modern era. It is estimated that 50 billion things would be connected to the internet by 2020, overshadowing the human generated data. Power system reliability and security has the most important requirement. And to ensure good quality and also continuous power supply to consumers. Due to Lack of monitoring system the utility do not get timely data on the health of lines. Utility comes to only when there is serious fault/damage. The power flow is diverted towards the fault and supply to the neighbouring zone is affected. One phase of a three-phase system gets lost, a phase loss occurs. This is referred as a 'single phasing', this failure generally caused by a blown fuse, thermal overload, broken wire, worn contact or mechanical failure. This is an advanced system that monitors power failure. There are three phases R, Y, and B when any one of the phases detects failure it notifies the concerned. This IOT system is connected,. Whenever the phases are been disconnected the system shows the power failure on LCD indicating voltage value and then it raises . Power system is classified into power generation, transmission and distribution. Transmission network is considered to be one of the vital parts of power system, as it connects the. supply and the demand. The loss in transmission and distribution network is considered to be very high, compared to other parts of power system. Currently, the electric power infrastructure is highly vulnerable against many forms of natural and malicious physical events, which can adversely affect the overall performance and stability of the grid. The faults in the transmission network obstruct the supply of power to the consumer. Usually when a fault occurs in the The system automatically detects fault, analyze and classify these faults and then, calculate the fault distance from the control room using an impedance-based algorithm method. Finally, the fault information is transmitted to the control room by IOT technology. After extracting useful features from the measured signals, a decision of fault or no fault on any phase or multiple phases of a transmission line is carried out using three SVM classifiers. The ground detection task is carried out by a proposed ground index. A device, which detects the fault and supplies information to the breaker for circuit interruption is called relay. The three phase currents and voltages of one end are taken as inputs in the proposed scheme. The feed forward neural network along with back propagation algorithm has been employed for detection and classification of the fault for analysis of each of the three phases involved in the process. This gives the fault location and immediately isolates the faulty part from the healthy part of the network. The circuit installed in power line this faulty area creates messages of location provided to



it and will transmit it directly to the area in-charge technician rather than to Electricity board. At each and every pole the RYB indicators are placed which gives ease of access of faulty phase up to the fault location.

II.LITERATURE REVIEW

Clarified that fault detection in transmission line has becoming a need of important, and increasing demand conditions and advancement made in the power system, fault identification has very become easier. And in this prototype use two bus system is simulated in MATALAB Manohar Singh: In this paper clarified to the Transmission line protection is very important thing in current scenario, because in power system 85 to 87% of power system faults are occurring in transmission lines. Classify the perfect technique, to detect the fault in transmission line, like line to line fault, line to ground fault etc. Anurag D. Borkhade: Clamfile to the proper detection of faults is cleared in transmission line is needful. In these paper detection and classification off sure these faults is done losed on the warelet analysis or power system translators. Wt has the the ability to decompose current and voltage signal. In this method used warelet which shows light signal and provide more features.Rajeev Valunjker 2017: Clarified that the paper aims to design auroredoser for three phase system with data acquisition system, that says this method is very handy to detect the fault on transmission lines. This system will reduce the humal efforts off closing the circuit breaker. The in such many solve the problems faced in transmission line and consumers bt using the method, we can easily detect the fault and resolve it and problem slved in real line very useful for the future.

III.METHODOLOGY STEPS TO PROGRAM AN ARDUINO

Programs written in Arduino are known as sketches. A basic sketch consists of 3 parts

1. Declaration of Variables
2. Initialization: It is written in the setup () function.
3. Control code: It is written in the loop () function.

The sketch is saved with .ino extension. Any operations like verifying, opening a sketch, saving a sketch can be done using the buttons on the toolbar or using the tool menu.

- The sketch should be stored in the sketchbook directory.
- Chose the proper board from the tools menu and the serial port numbers.
- Click on the upload button or chose upload from the tools menu. Thus the code is uploaded by the bootloader onto the microcontroller.

Few of basic Adruino functions are:

- **digitalRead(pin):** Reads the digital value at the given pin.
- **digitalWrite(pin, value):** Writes the digital value to the given pin
- **pinMode(pin, mode):** Sets the pin to input or output mode.
- **analogRead(pin):** Reads and returns the value.
- **analogWrite(pin, value):** Writes the value to that pin.
- **serial.begin(baud rate):** Sets the beginning of serial communication by setting the bit rate.

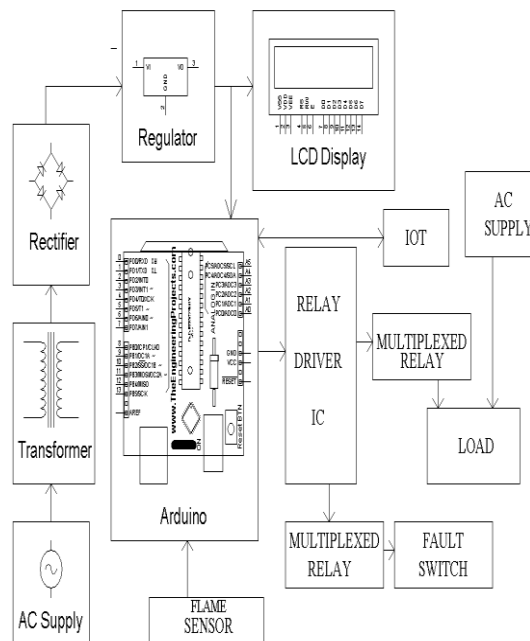


Figure.1 Circuit Interface

IV.IMPLMENTATION

Working: A Three Phase Line Fault Detection is a device which provides visual indication & remote detection of the abnormal condition on electrical power distribution system.. While patrolling of this fault it can be detected by indication lamps on RYB phase. In recent, impedance relay or distance relays are used to detect and cleared the fault, but this system requires long time to calculate the distance using the impedance & the pre-fault current relay, till to reach the fault location and repair the faulty phase, the system will be in OFF state and the supply to the consumers is unreliable Open circuit faults:- These faults occur due to the failure of one or more conductors. The most common causes of these faults include joint failures of cables and overhead lines, and failure of one or more phase of circuit breaker and also due to melting of a fuse or conductor in one or more phases. Open circuit faults are also called as series faults. These are unsymmetrical or unbalanced type of faults except open circuit fault Short circuit faults:- A short circuit can be defined as an abnormal connection of very low impedance between two points of different potential, whether made intentionally or accidentally. These areS. the most common and severe kind of faults, resulting in the flow of abnormal high currents through the equipment or transmission lines. If these faults are allowed to persist even for a short period, it leads to the extensive damage to the equipment. Short circuit faults are also called as shunt faultssply to the load. These faults are caused due to the insulation failure between phase conductors or between earth and phase conductors or both. The various possible short circuit fault conditions include three phases to earth, phase to phase, single phase to earth, two phases to earth and phase to phase. In single line to ground fault, fault occurs between any one of the three lines and the ground. In double line to ground fault, fault occurs between any two of the three lines and the ground. In line to line fault, fault occurs between any two lines. When fault occurs, there is an abrupt change in voltage. This change in voltage may cause serious damages to the system if not corrected in time. So immediate step of fault correction is isolation of the faulty part from the rest of the system Programs uploaded in Arduino UNO kit to detect faults from the underground cables. When a fault occur in the underground cables, we can find out faults through Arduino controller kit. LCD display which displays the faults in Kilometre. In this project we created faults manually. The value of the resistance is depends upon the length of the cable. In here resistance is the leading role of the project. If any deviation occurs in the resistance, the value of the voltage will be changed that particular point is called FAULT. We are finding out those faults. Project is to determine the line to line fault as well as the line to ground fault USING AN Arduino board. While a fault occurs for some reason, the repairing process related to that particular cable is difficult due to not knowing the exact location of the cable fault. The project uses the standard concept of Ohms law i.e., when a low DC voltage is applied at the feeder end through a series resistor (Cable lines), then current would vary depending upon the location of fault in the cable. In case there is a short circuit (Line to Ground), the voltage across series resistors changes accordingly, which is then fed to inbuilt ADC of Arduino board to develop precise digital data for display in kilometers. It is assembled with a set of resistors representing cable length in KM's and fault creation is made by a set of switches at every known KM to cross check the accuracy of the same. The fault occurring at a particular distance and the respective phase is displayed on a LCD interfaced to the Arduino board. This



objective of this project is to determine the distance of the line to ground line to line fault from the base station in kilometre using arduino board Here we have used flame sensor. Whenever any flame is detected the project stopes the supply to the load. We are use in the esp. 8266 and all the data send in iot page.

V.RESULT

Paper is to determine the line to line fault as well as the line to ground fault using an Arduino board. While a fault occurs for some reason, the repairing process related to that particular cable is difficult due to not knowing the exact location of the cable fault. The project uses the standard concept of Ohms law i.e., when a low DC voltage is applied at the feeder end through a series resistor (Cable lines), then current would vary depending upon the location of fault in the cable. In case there is a short circuit (Line to Ground), the voltage across series resistors changes accordingly, which is then fed to inbuilt ADC of Arduino board to develop precise digital data for display in kilometers. It is assembled with a set of resistors representing cable length in KM's and fault creation is made by a set of switches at every known KM to cross check the accuracy of the same. The fault occurring at a particular distance and the respective phase is displayed on a LCD interfaced to the Arduino board. This objective of this project is to determine the distance of the line to ground line to line fault from the base station in kilometre using arduino board Project is to determine the line to line fault as well as the line to ground fault Using an Arduino board. While a fault occurs for some reason, the repairing process related to that particular cable is difficult due to not knowing the exact location of the cable fault. The paper uses the standard concept of Ohms law i.e., when a low DC voltage is applied at the feeder end through a series resistor (Cable lines), then current would vary depending upon the location of fault in the cable. In case there is a short circuit (Line to Ground), the voltage across series resistors changes accordingly, which is then fed to inbuilt ADC of Arduino board to develop precise digital data for display in kilometers. It is assembled with a set of resistors representing cable length in KM's and fault creation is made by a set of switches at every known KM to cross check the accuracy of the same. The fault occurring at a particular distance and the respective phase is displayed on a LCD interfaced to the Arduino board. This objective of this project is to determine the distance of the line to ground line to line fault from the base station in kilometre using arduino board.

VI. CONCLUSION

A model design to solve the problems faced by consumer by using Aurdino. We can easily detect the type fault and solve it and there distance in real time, this prototype model is very effective. It is works in less time perfect distance of fault is locate. Avoid the future problem in transmission line. The model is designed to solve the problems faced by power system. By using such a method, we can easily detect the fault and resolve it. It is highly reliable and locates the fault in three phase transmission line and also supposed to data storage. It allows to record all of the real time data sheets up to date and avoiding future transmission line problems.

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