

# IOT Based Three Phase Transmission Line Fault Detection and Classification

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**Abstract** -In the current scenario transmission line fault Detection is major and important issue. In transmission line 85-87% faults of power system occur in these overhead Transmission line. In this paper, we discuss about various Method to control the fault generated in transmission line and solve this in real time. The heart of this module is Aurdino and IOT based software this will detect the fault, and exact location of fault also which type of fault. It Will shows in display and software also be in this information is transmitted to the control room.

**Keywords**- Aurdino, Relay, LCD display, IOT software, P.T

## 1. INTRODUCTION

In the current time electricity is the most important part in human being and day to day life cycle. Faults on transmission line can be cause mechanical failure, excessive internal and external stresses, lightning strikes etc. In transmission line such type of fault three phase line to line fault, three phase line to ground fault, Double line to ground fault. Power system is classified into three main types like this, power generation, transmission and distribution transmission system is considered to main part of the power system. Current scenario as it lot supply and demand of transmission network. Due to the fault in transmission line disturb the supply of power to the consumer. There are some benefits to accurate fault detection system, because including less time to save electricity, low maintenance cost, save the electrical equipment's. In current time of India, A system is not detect the fault in real time these type of system lot of hazardous in transmission network.

## 2. LITERATURE SURVEY

In this paper clarified to the overhead Transmission system protection is very crucial thing in current scenario, because in power system 85 to 87% of power system faults are coming off in transmission lines. Classify the perfect technique, to detect the fault in transmission line, like line to line fault, line to ground fault etc.[5]

This paper clarified to the perfect detection of fault. In the use of wavelet analysis or power system translators. In this system a huge ability to spoil the current and voltage signal. In this method used wavelet which shows light signal and provide more features[6].

Clarified that the paper aims to design the fault detection system with the help of autorecloser of overhead or three phase system with data acquisition system that says this method is very hardly to detect the fault on transmission lines [7].

This system will deplete the man power off closing the circuit breaker. This pater shows the in such many solve the problems faced in transmission line and consumers by using the method, we can easily detect the fault and resolve it and problem solved in real line very useful for the future.

## 3. METHODOLOGY

Here we design a simple prototype model of 3 phase fault detection system. The impedance of transmission line is proportional to the line length. So here we utilized combination of resistance in series, for each phase, one relay is use to isolate the load at the time of fault which give exact length of fault occur on line. The mastermind of our project is Aurdino Uno. The DC supply is require for controlling board. Which is provides with the help of rectifier and transformer combination. Output switches is given analog pin or Aurdino (Uno) and display is also connected to digital output pin of Aurdino. So when we move fault it indicate of display with exact distance, and at a same time Aurdino give output to mp really and it disconnect load from supply. This all thing happen as soon as fault is occur in line. Due to proper program insert in Aurdino on a based. It is possible become voltage of Ade pin is changes according to flowing from line and it depend upon distance of line.

## 4. OBJECTIVE

In this paper we shall discuss about transmission line fault. The main objective of this prototype model we try to make efforts less system to decreases human work and hazard

the electrical equipment. To boost the system stability, reliability and strong the economic growth.

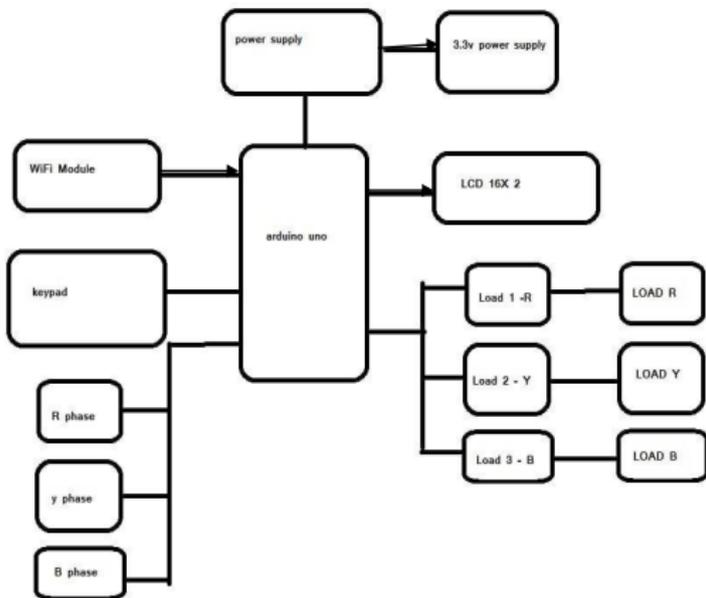


Fig 1 Block Diagram of Model

Here Dc supply is required for controlling board which is provided with the help of rectifier and transformer combination. We have used PT sensors to identify fault in their respective phases Relay is used to isolate the load at the time of fault We are using arduino as brain of system. So it is going to communicate with wifi modules as well as input and output devices Output switches are given to analog pin of arduino and display is connected to digital pin of arduino So, When fault occurs, Arduino gives output to relay and supply is interrupted. We are using 8266 wifi module. So information about fault is received on our mobile or pc Using this project, we can know the fault type and we can save electrical components from damaging

Type of fault			
	Arrangement	Percentage of fault occurrence%	simplicity
Line to ground	L to G	87	Very less
Line to line	L to L	9	Less
Doubleline to ground	L-L-G	8	Limited
Three phase	3-phase	>3	Very more

Table 1 Type of Fault

## 5. EQUIPEMENT USED

### LCD Display

The term LCD stands for Liquid Crystal Display. It is a kind of electronic display module used in various applications, such as various circuits and devices such as mobile phones, calculators, computers, televisions, etc. These displays are mainly suitable for multi-segment and 7-segment light-emitting diodes. The main advantage of using this module is that it is cost effective. It's easy to program, animated, and has no limits on displaying custom characters, special animations, or even animations.



### Voltage Transformer

A voltage transformer (VT), also known as a potential transformer (PT), is a type of parallel-connected potential transformer. They are designed to have negligible loading on the power supply they are measuring and provide accurate voltage ratios and

### Arduino

The Arduino UNO is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (6 of which can be used as PWM outputs), 6 analog inputs, a 16MHz ceramic resonator, a USB connector, a power jack, an ICSP header, and a reset button. Contains everything needed to support the microcontroller. Simply plug it into your computer with a USB cable, or power it up with an AC-DC adapter or battery to get started. The UNO differs from all previous boards in that it does not use the FTDI USB Toseri driver chip. Instead the ATmega16U2 (Atmega8U2 up to version R2) is programmed as a USB to



## IOT MODULE

The ESP8266 is a tiny Wi-Fi module built with the ESP8266 chip that allows your microcontroller to wirelessly connect to the internet at a very low cost. It would be a great option. It's intended for Internet of Things (IoT) projects, but it can be difficult to work with beginners without prior knowledge of the modules. In this tutorial, we hope to show you how to connect ESP8266 to Arduino and perform basic tasks such as connecting to a Wi-Fi network.



## RELAY

This is a 1 channel 5V relay board module for Arduino PIC AVR DSP ARM. It can be controlled by a wide range of microcomputers such as Arduino, AVR, PIC, and ARM. Each requires 15mA ~ 20mA drive current, equipped with high current relays: DC 5V/10A, AC 250V/10A Standard interface, compatible with microcontrollers.



## 6. ADVANTAGES

- Detect the exact fault location
- Human efforts minimizes
- Improve the system performance

## 7. APPLICATION

- Used in Industrial Fault detection system
- Used in transmission line fault detection system
- It can be used in mine

## 8. CONCLUSIONS

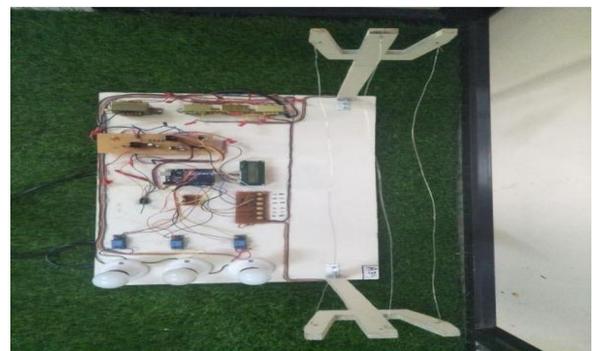
In this paper a model design to solve the problems faced by consumer by using Arduino and IOT software. We can easily detect the type fault and solve it and there distance in real time, this prototype model is very effective. It works in less time perfect distance of fault is locate. Avoid the future problem in transmission line.

## 9. FUTURE SCOPE

In the future intimation of this prototype module or project are very great debate the lot of time and assets it saves. The project it will help in future it can be used as reference in future for implementing the base protection system in transmission line system. Also these system is very reliable than the SCADA. This system it will control or signaling the mobile app this called IOT based system. This system shows the exact fault location and fault clearing is very quick this features making this project very unique and useful in future.

## 10. OUR MODULE

In this project we proposed IoT based real time fault sensing and locating fault. We take power supply, 3.3V power supply to operating of module. We arrange three phase transmission line structure and three phases R-Y-B. Then this use of supply and activate module. Arduino is connected to power supply Arduino is act as brain. We use Wi-Fi module these indicate and sense which type of fault and then provide the information. In this system, we have introduced an improved way to detect faults. Arduino is working as the brain of our system. Relays are used for protection because relays isolate the load at the time of fault. In case, there is any network problem, we have using LCD display. So that, one can see fault information in the control room.



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