International Journal of Scientific Research in Science, Engineering and Technology

Print ISSN - 2395-1990
Online ISSN : 2394-4099

OPEN ACCESS

Available Online at : www.ijsrset.com
doi : https://doi.org/10.32628/IJSRSET

Automatic Fault Detection of Transmission Line Using IOT

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ARTICLEINFO

Article History:

Accepted: 05 April 2024
Published: 19 April 2024

Publication Issue :
Volume 11, Issue 2
March-April-2024
Page Number :
342-345

ABSTRACT

The development and advance in technology, many things are changes. The technology laid out to understand its importance like in urban areas, the electrical Line to go Transmission instead of overhead lines, which grab less space and is consider as the effective and efficient way of transmission. But the problem ascends when any fault be occurred in the Transmission Line and it's also difficult to detect the proper location of the fault during the process of repairing that especial Line and the methods existed till now follows some algorithm in order to scan the location of the fault. The raised system which constitute of current sensors, microcontroller (Node MCU) and Wi-Fi modem which creates a course between the combined hardware and internet so that the real time data can be successively communicated towards server its being successively communicate with towards server and along with this everything becomes smart and interconnected with the help of IoT (internet of things) those are real time data can be retrieved in pc or mobile phones from the server. Hitherward by using useful stage provided by IoT any one can recover information whenever they are necessary. By implementing the proposed system life of the Line will also get by grown because after implementing the system the supply transmission of the power can be closed till the fault gets mend and through this the inessential losses which are developed though the leakage of current can be avoided.

Keywords: Current sensor ,Node MCU ,IOT (Internet Of Thing)

I. INTRODUCTION

Transmission Line protection is an important issue in power system engineering because 85-87% of power system faults are occurring in Transmission lines. This paper is quick on the security schemes and identify various types of defects in a transmission line and for reliable management Provides a technique for classifying. Discrimination among different types of faults on the Transmission lines is achieved by application of evolutionary programming tools. PSCAD/EMTDC software is used to simulate different operating and fault conditions on high voltage Transmission line, namely single phase to ground fault,

line to line fault, double line to ground and three phase short circuit. The discrete wavelet transforms (DWT) is applied for decomposition of fault transients, because of its ability to extract information from the transient signal, simultaneously both in time and frequency domain. Data sets obtained from DWT are used for SVM architecture training and testing. After removing useful features from the measured signals, a fault or a fault is decided at any stage or multiple stage of the transmission line using three SVM classifiers. The ground detection function is performed by the proposed ground index. The Gaussian radial base kernel function (RBF) has been used, and the performances of the classifiers were evaluated based on fault classification accuracy. To determine the optimal parameter settings for an SVM classification (such as the type of kernel function, its associated parameters, and Regularization parameter C), fivefold cross-validation has been applied to the training organization. It has been observed that an SVM with an RBF kernel provides better fault classification accuracy than an SVM with a multivariate kernel. It was found that the proposed project is very fast And Accurate and It has proven to be a powerful classifier for digital distance protection.

II. OBJECTIVES

- The main goal of our project is to easily find the transmission line fault that is below ground.
- We can see which fault is near the pole.
- We can monitor how much current is going on each line.
- Monitor line fault and line current from anywhere in the world through the Internet.

III. COMPONENTS OF PROJECT

NODE MCU

Node MCU is an open source IOT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP- 12 module. The term "Node MCU" by default refers to the firmware rather than the development kits. The firmware uses the Lua scripting language. It is based on the eLua project and built on the Espressif Non-OS SDK for ESP8266. It uses many open-source projects, such as lua-cjson and SPIFFS.

LM2596 Voltage Converter

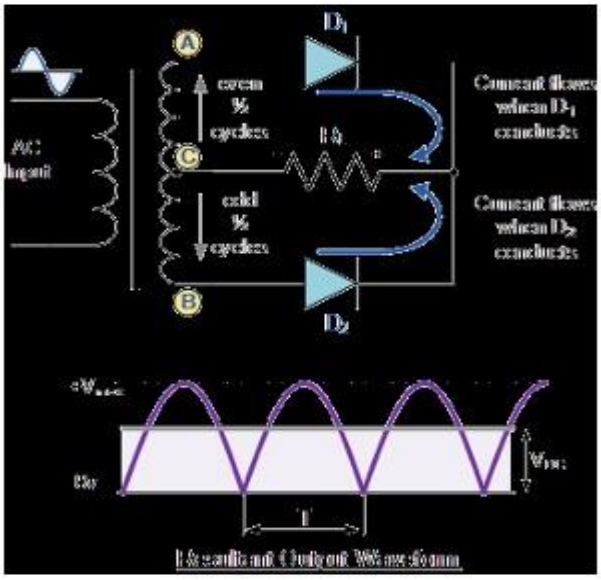
The LM2596 series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving a 3-A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3 V, 5 V, 12 V, and an adjustable output version. Requiring a base number of external components, these regulators are easy to utilize and incorporate inside frequency pay, and a fixed frequency oscillator. The LM2596 arrangement works at an exchanging frequency of 150 kHz, in this manner permitting littler measured filter parts than what might be required with lower frequency exchanging regulators. Accessible in a standard 7-pin TO-220 bundle with a few diverse lead twist choices, and a 7pin TO-263 surface mount bundle.

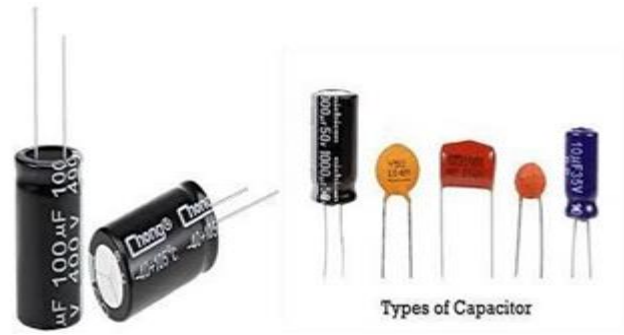
IOT SYSTEM

CAPACITOR

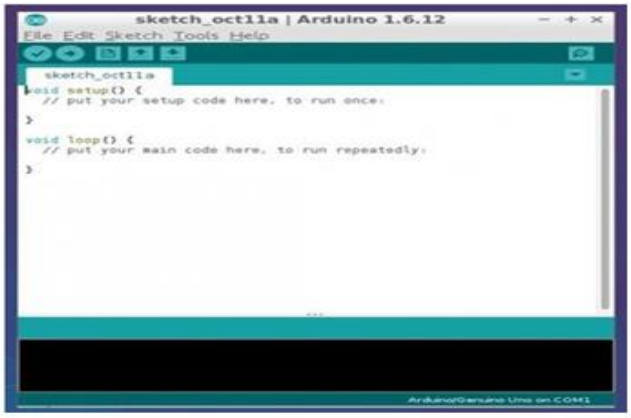
A capacitor is a latent two-terminal electrical part that stores potential energy in an electric field. The impact of a capacitor is known as capacitance. While some capacitance exists between any two electrical conduits in nearness in a circuit, a capacitor is a segment intended to add capacitance to a circuit. The capacitor was initially known as a condenser or condensator. The first name is still generally the physical structure and development of viable capacitors fluctuate broadly and numerous capacitor types are in like manner use. Most capacitors contain at any rate two electrical channels often as metallic plates or surfaces isolated by a dielectric medium. A conduit might be a foil, slim film, sintered dab of metal, or an electrolyte. The no leading dielectric acts to build the capacitor's charge limit.

RECTIFIER:





SOFTWARE PICTURE : ARDUINO IDE



Advantages:

- Can be easily created.
- Essential instruments, readily available in the market
- Where the fault in the line can be easily found.
- Each line can be monitored by line current

Applications:

• The transmission line below the ground.

• Java transmission line in river / sea tunnels.

• The system can also be installed on the transmission line.

IV. CONCLUSION

We have created a modern project on Transmission Line fault. In this project we have a line taken directly from Ac Current to give us power, which flows as dc power in the project. Here we have basically created a dc power source. Using a step-down transformer, we have converted the voltage to 24 volts, then these 24 volts are dc by using a rectifier. So, when dc is created, little something goes from AC. So, we got pure DC using a capacitor. Now we need 5 volts DC for the controller, we have 5 volts DC. Here we have taken a certain amount of voltage using a buck module. We have given the controller a certain amount of voltage. The main goal of our project is to diagnose the Transmission Line fault, here we are for three phase

lines, we have created two fault sensors on each line, and we have connected the output of the fault sensor to the digital pin of the controller.

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