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Transmission Line Parameters Monitoring system using IoT

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ABSTRACT

Electrical power is transmitted from the generation plants to end-users at distant locations through the transmission lines. These lines are exposed to various environmental conditions and faults may occur causing power interruption to end users, damage to the power system. The fault detection has been a main objective of power system engineers, in transmission and distribution systems. Identification of fault source is tedious task; fast fault detection can help to protect the equipment before any significant damage of the equipment. The exact fault detection can help service man to remove persistent of the faults and type the faults occur regularly, thus reducing the occurrence of fault and minimize the time of power outages. This paper is intended to detect the of fault in transmission line using an Node MCU and the same is transmitted to control center using IoT device.

Key words: ***Transmission line, IoT, Node MCU.***

1. INTRODUCTION

The internet of things is a system that connects analogue, mechanical, and digital equipment, as well as items and unique identifiers, to convey data without human intervention. Transmission lines must be monitored in order to assess their performance and assure their safety. The domestic, industrial, and defence sectors are among the world's IOT users. In transmission lines, IoT is used to monitor parameters and detect faults. When a fault occursin an overhead transmission line system, frequent variations in voltage and current occur at the point of fault, resulting in high frequency. IoT technology allows physical items to be connected to the internet, allowing them to be monitored and controlled from any location. With the use of IoT, we will be able to monitor all types of transmission line failures as well as transmission line parameters. [5]

2. IoT

The internet of things, or IoT, is a network that connects devices, analogue, mechanical, and digital machines, items, and people with unique identifiers (UIDs) and the ability to exchange data across a network without the need for human-to-human or human-to-computer interaction. "A network of Internet-connected items capable of collecting and transferring data" is how the Internet of Things is defined. The concept of connecting any item with an on/off switch to the internet and then delivering a suitable output is known as the internet of things (IoT).

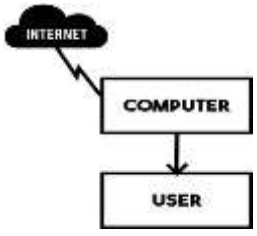

Fig -1 Internet of Things (IoT).

2.2 Node MCU

NodeMCU is an open source platform with an open hardware design that anybody may edit, adapt, or construct. The ESP8266 wifi enabled chip is used in the NodeMCU Dev Kit/board. The ESP8266 is a low-cost Wi- Fi chip with TCP/IP protocol designed by Espressif Systems. The ESP8266 Documentation has further information. The SPIFFS (Serial Peripheral Interface Flash File System) file system is used by NodeMCU. The Espressif NON- OS SDK is used to layer NodeMCU, which is written in C. The firmware was originally created as a companion project to the popular ESP8266-based NodeMCU development modules, but it is now community-supported and may be used with any ESP module. In general, NodeMCU Dev boards from Amica, DOIT, Lolin, and D1 mini/Wemos are available on the market. Amica manufactures NodeMCU ESP8266

Development Boards v1.0(Version2) with pre-programmed hardware. NodeMCU is a device that resembles an Arduino. The ESP8266 is the key component. It contains pins that can be programmed. It has WiFi integrated in. It may be charged via a micro-usb connector. It is inexpensive. It may be programmed using a variety of different programming environments.

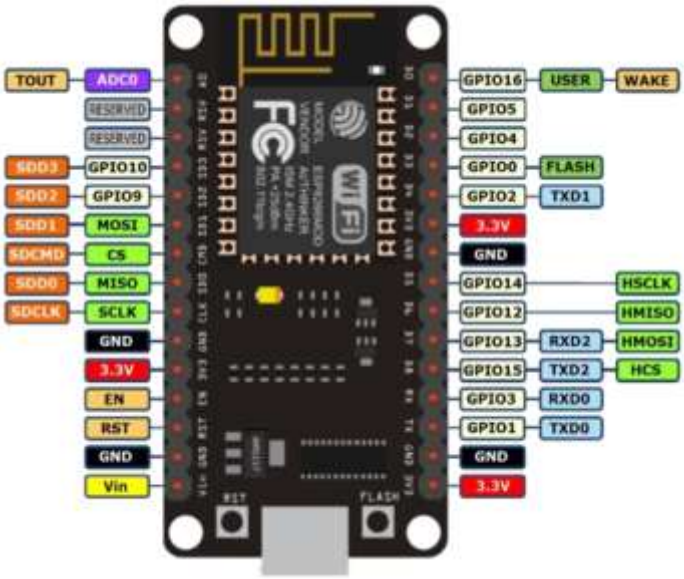

Fig-2: Pin out of Node MCU

2.3 BLOCK DIAGRAM

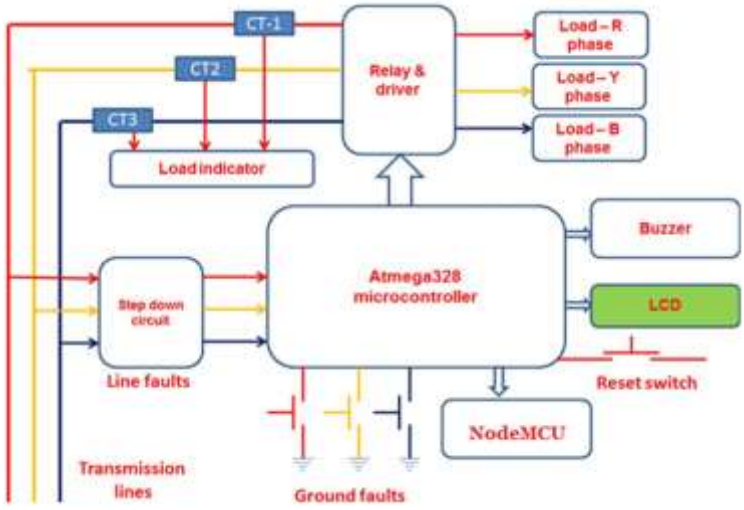

Fig 3: Block Diagram

3. PROPOSED METHODOLOGY

The proposed project work is concentrated on the monitoring of high transmission line. For monitoring purpose, here test the different type of faults. The Node MCU send to the web page through Wi-Fi module and can setthe limit for each fault. If any parameter crosses its limit then system sends the warning message to the authority mobile. The overhead transmission line monitoring system is examined by comparing the calculated values using theoretical equation with the actual measured results. In addition, the proposed system could co-operate with IoT systems to improve its feasibility and practicality. The data of the various sensor are transmitted through the Wi-Fi module and stored in a database. This information of faults could be provided to power companies to improve the safety of transmission lines or serve as reference in power dispatch centre. All data of overhead transmission line recorded in every hour on the hour. Whenever a fault occurs in transmission line it takes time and much more cost torecover it. The risk of living being life is also there. Here use of IoT in transmission line will help to improve in transmission line monitoring and maintains of transmission line, it will

also improve the efficiency, reduce the labor cost and save time in maintains of transmission line. Fast repair to revive back the power system and Reduces the time to locate the fault in the field. The system can be tested in the field for real time fault monitoring. IoT services on distributed located devices account for the main energy cost, one way to save on energy cost is to co-locate several services on a device and reduce the bandwidth consumption to save computing and communication energy. Therefore, using IoT in transmission line monitoring is essential and low cost and effective.

Fig -4 Working model of IoT based Transmission line Monitoring System.

4. CONCLUSION

On the basis of the Node MCU Wifi Module, this monitoring of transmission line faults is carried out. An IoT-based model for fault detection in transmission lines is presented here. This approach also has a high operationalspeed. For the sake of demonstration, a fault in the transmission line is manually introduced. Using a Wi-Fi module, the defect is sent to the control centre. The proposed technology now allows us to find faults in three-phase transmission lines in a cost-effective and highly reliable manner, while also allowing us to save data.

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