TRANSMISSION LINE FAULT DETECTION AND AUTOMATIC DISCONNECTION USING WEBSERVER

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ABSTRACT

When a fault occurs, the insulation path and the conductive path are cut, causing a short circuit and open circuit in the conductor. At best, the electronic device operates at the same voltage and measured current. However, in the wrong case, the voltage and current values deviate from their values. Most of our electrical power comes from switching devices and relays, circuit breakers, fuses, etc. protected by protective equipment such as to reduce service due to power outage after a problem occurs. In this project, the web server has been used as an error detection system and it has been shown that there is a problem in the transmission.

The proposed system consists of various protection devices, power and current measurement section, microcontroller section, LED display section and web server. The system will help the power plant and the maintenance personnel in the region to find the faults in a short time and prevent the generator from being damaged. In this system, there are many devices such as current transformers, voltage transformers, microcontrollers, relay ICs, voltage regulators. The system automatically detects, identifies and classifies errors with the help of a microcontroller. The system also provides information about what kind of fault has occurred in the transmission line, for example L-L (line to line), L-G (line to earth), L-L-G (two lines to earth) faults, L-L-L and L-LL-G (symmetrical errors). And the data is sent from the web server to the service provider's substation. Here in this paper, we developed a microcontroller-based transmission error detection system that sends information and error distribution from the web server to the distribution system. It also sends current and voltage values to the panel**.**

Index Terms – Voltage Transformer, Microcontroller, Relay IC, Voltage Regulator

I. INTRODUCTION

More than 80% of faults in electrical systems occur in transmission lines. This article presents the design and application of error handling, classification and prevention techniques. Most current and voltage signal distortions are caused by faults. Incorrect operation can cause interference in electronic equipment that can damage our products. The time required to locate the fault is greatly reduced because the system automatically informs about the location of the fault with the help of the microcontroller.

Electrical systems, machines and equipment are subject to a variety of failures while operating. When a fault occurs, the characteristic value of the transmission line is transferred from the value of the other value to the grid by lightning, wind, storm, even tree falling, equipment failure, etc. It will change until it arrives. In our system, phase CTs and PTs detect voltages and currents and the results are transmitted to the microcontroller and this information is sent to the substation service provider via the web server. This helps determine the type and location of the fault

II. OBJECTIVE

Main goals concerning this work maybe pictured as:

- Fast auto disconnects

- 7x24 monitoring

- Check type of fault

- Check fault location by viewing node number

- Check current value and voltage continuously

- Check if the supply is open or close

III. SYSTEM BLOCK DIAGRAM
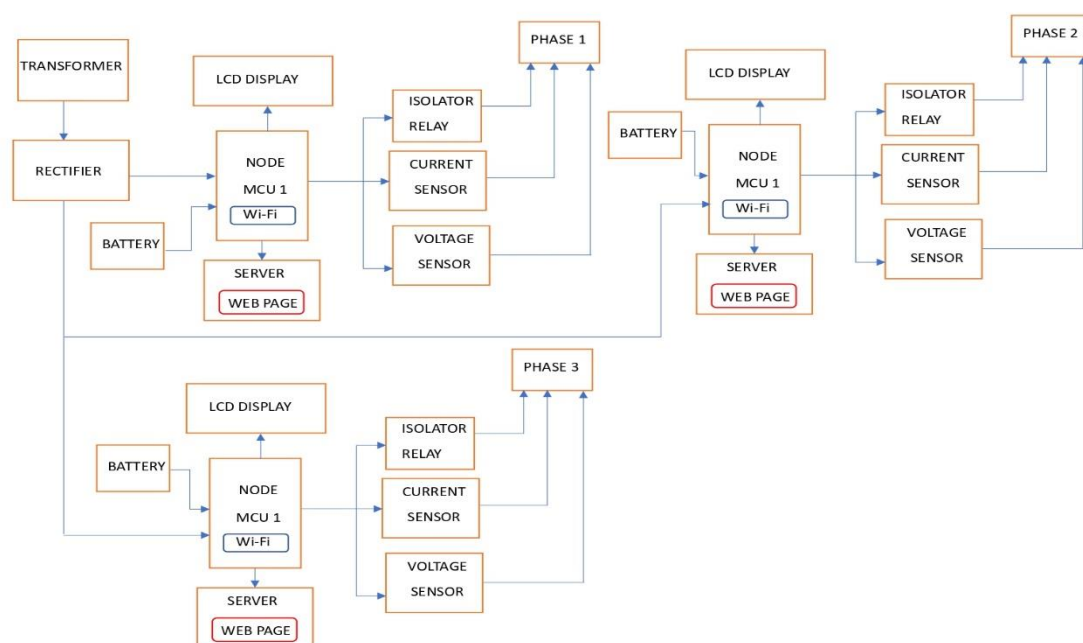
IV. ADVANTAGES

- 24x7 monitoring

- Identifies the exact fault

- Identifies the fault location using node network

- Fast automatic disconnection

- Reduce accidents

- Safe transmission

- Low maintenance cost

- Reduce man power

- Shows whether the supply is ON or OFF

- Measure the values of voltage and current

V. DISADVANTAGES

- Can not reconnect automatically
- Require proper Wi-Fi connection
- Proper maintenance is required
- High initial cost
- Absence of warning alarm

VI. APPLICATIONS

It maybe secondhand in various fields like:

- Transmission
- Distribution

VIII. REFERENCES

1. Zahoor Hussain, Shahzad Memon, Lachhman Das, Muhammad Hammad-u-Salam, Nasir Ahemd Memon,Jawad Hussain Awan, Raza Hussain Shah, Zulfiqar Ali Bhutto, GSM Based On Demand Smart Power Load Management Service Module, IJCSNS International Journal of Computer Science and Network Security, VOL.17 No.9, September 2017.

2. Mustafa Burunkaya,Tufan Pass "Smart meter design implementation using Zigbee based wireless sensor network in grid" 2017,4th international conference on electrical andelectronics engineering.

3. Birendrakumar Sahani, Tejashree Ravi, Akibjaved Tamboli , Ranjeet Pisal, " IoT BasednSmart Energy Meter," International Research Journal of Engineering and Technology -April 2017.

4. Sunday Olufenka Ayodele, Nazmat Toyin, Surajudeen-Bakinde, Timilehin David Oloruntoba, Abdulrahaman Okino Otuoze, Nasir Faruk Development of an Internet based prepaid energy meter Published in: 2017

5. Sneha Chaudhari, Purvang Rathod, Ashfaque Shaikh, Darshan Vora, Jignesha Ahir Smart Energy Meter Using Arduino and GSM International Conference on Trends in Electronics and Informatics (ICEI 2017)

6. Aamir shafi ,Mohsin khan and Naeem javed "Design of smart energy meter with overloadtrip facilities" 2017, International journal of engineering and advanced technology.

7. Miqdad, A., et al. "Space Cooling Load Monitoring System with IoT." 2018 IEEE 5th International Conference on Smart Instrumentation, Measurement and Application (ICSIMA). IEEE, 2018.

8. Win Adiyansyah Indra, Fatimah Bt Morad, Norfadzlia Binti Mohd Yusof and Siti Asma Che Aziz, GSM-Based Smart Energy Meter with Arduino Uno, International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 6 (2018)

9. Ali RA, Hussain M, Mahmood T. Low Cost GSM based Smart Energy Meter Design:Capable of Demand Side Management and Data Logging, 2018 3rd International Electrical Engineering Conference (IEEC 2018) Feb, 2018