



IOT BASED TRANSFORMER MONITORING SYSTEM USING ARDUINO AND ESP8266

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ABSTRACT

Transformers are the main building block in a power system. Any damages in transformers adversely affects the balance of a power system. The damages are mainly occurring due to overloading and inefficient cooling. The main objective of the real time monitoring of the health conditions of the distribution transformer using IOT technology.

The parameters such as temperature, under voltage, over voltage and oil level of a transformer are monitored, processed and recorded in servers. For this purpose, we use sensors interfaced with atmega328 microcontroller. The recorded data can be send using Wi-Fi module and accessed from anywhere around the world using IOT technology. This helps in identifying without human dependency. This helps in identifying and solving a problem before a failure without human monitoring.

Key Words: (Arduino, Esp8266, Transformer)

1. INTRODUCTION

As a large number of transformers are distributed over a wide area in present electric systems, it's difficult to measure the condition manually of every single transformer. So we need a distribution transformer system to monitor all essential parameters operation, and send to the monitoring system in time. It provides the necessary information about the health of the transformer. This Proposed project

presents design and implementation of IOT embedded system to measure over voltage, under voltage, transformer Oil level and temperature.

The output values of sensors are processed and updated in the system. System programmed with some predefined instructions to check abnormal conditions. If there is any abnormality on the system, details are automatically updated in the internet through serial communication. This Internet of Things (IOT) will help the utilities to optimally utilize transformers and identify problems before any catastrophic failure occurs Monitoring transformer for the problem before they occur can prevent faults that are costly to repair and result in a loss of electricity. Currently, failure of the transformer can be detected by color changing of silica gel and decreasing the quality and viscosity of oil. The main aim of the project is to acquire real-time data of transformer remotely over the internet falling under the

2. LITERATURE SURVEY

[1] Title of paper: IOT BASED DISTRIBUTION TRANSFORMER MONITORING AND CONTROLLING SYSTEM

Author: Pustaraj Kore Year: 2019

Summary: In this paper we are going to gauge temperature and humidity by utilizing Node MCU apparatus and DHT11, which will be useful for adjusting the earth to build the productivity in this in agriculture sector today's

weather forecasting systems accessible based on communication.

[2] Title of paper: DISTRIBUTION TRANSFORMER MONITORING SYSTEM

Author: SAHIL P. JADHAV Year:2020

Summary: The main aim of this system is distribution transformer monitoring and controlling through IOT. Also, it sends SMS to a central database via the GSM modem for further processing. The idea of on-line monitoring system mixes a global service

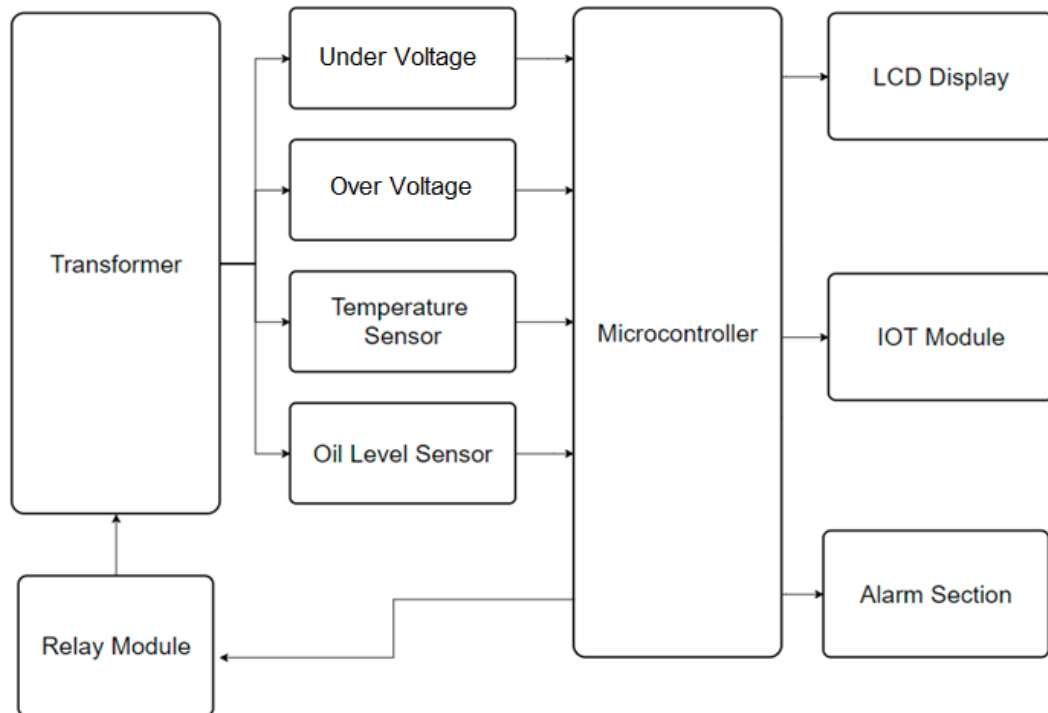
mobile (GSM) Modem, with chip micro controller and different sensors

[3] Title of paper: Intelligent Transformer (I-Transformer)

Author: Kiran Sara Thomas Year:2021

Summary: In this paper has collective information about transformer monitoring system that has many advantages such as ease in information collection, better management, condition assessment and decision making for engineers.

3. Block diagram:



Description: Transformer is a static device which convert the voltage from one level to other level without change in frequency and power. Load is connected at secondary winding of the transformer. Due to many factor suddenly increase in load can cause overloading, over-voltages and overheating that can harmful to the transformer windings insulation and severe damage can be occur on the secondary side of transformer.

The transformers play a vital role in distribution part of power system. Therefore the monitoring and protection of transformer is very crucial. This system introduces a new and improved method of transformer health parameter monitoring using IOT. The sensors incorporated in the system collect the data of transformer health parameters.

4. Advantages

- Easy to use
- Remote monitoring using IOT
- No men power required
- LCD for local monitoring
- Cost Effective
- Auto switch off
- Multi fault

5. Limitations

- Complex Hardware
- One system required for one transformer

6. Future Scope: This project is implementing using microcontroller. Basedn on fault microcontroller will check automatically connected sensor parameters and related fault. But in future we can add many other fault also in this project.

With minimum changes we can increase function in this project and this implementation will increase with effective way in future.

Conclusion:

An IOT based transformer monitoring system for power transformer was designed, implemented and tested. It is quite useful as compared to manual monitoring and also it is reliable as it is not possible to monitor always the oil level, oil temperature rise, ambient temperature rise, load current manually Transformer Health Monitoring will help to identify or recognize unexpected situations before any serious failure, which leads to greater reliability and significant cost savings. If transformer is in abnormal condition, we can know from anywhere. No human power need to monitor the transformer. Details about

the transformer are automatically updated in IOT cloud.

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