

# GSM Based Transformer Remote Monitoring System with Alarm System on Fault Detection

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**Abstract:-** A GSM based Transformer Monitoring system is basically a remote monitoring technique and methodology for the transformer. An alert or the proclamation will be communicated to the remote operator via A GSM Module. When the Transformer parameters are not upto the desired value, it will be displayed on given LCD and notification will be emanate on GSM MODULE. In addition to this we will be also using an Alarm buzzer circuit which will buzz when the fault will be detected in the circuit, relay and bulb, which will automatically trip off as soon as the Fault will be perceive in the Circuit.

**Keywords:** Emanate ,Methodology, perceive, Proclamation, Parameter

## 1.INTRODUCTION

In GSS, many times we come across the instances when the Vital Parameters of Transformer does not stand upon the requirement. This problem may arise due to various reasons such as human Fault, Technical Fault, Natural circumstances, abrupt environmental conditions and etc.

Our main Objective here is not to mend the faults or the undesired parameters of Transformer but to give a real time alert to the Transformer Operator or Remote Operator so that they can rectify the Fault in specified time. The Faults Discussed in this Paper are Earth Current, Oil Level, and Temp. of Oil in the Transformer. Software Implementation will be performed by using the sensors and Hardware Implementation will be performed by using a Prototype as real time simulation.

## 2.SOFTWARE IMPLEMENTATION

For Software Implementation, we have measured Oil Level, Temp. of Oil, and Earth Current. We have used Arduino UNO for Interfacing the Transformer with it.

We will be using 16\*2 LCD display for showcasing the required Information. Moreover, we will be using different types of sensors to determine the Faults in our Transformer.

Firstly we have used Ultrasonic Sound Sensor (Extra Library) to determine the Oil Level in the Transformer Tank. Ultrasonic sensor is generally used to measure the distance of a object using sound waves it consist of a transmitter and receiver pair a transmitter transmit the sound wave at particular frequency and the reflected wave from the object is received by the receiver. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the ultrasonic sensor and the object.



Figure 1: Ultrasonic Sound Sensor

Secondly we have used the LM35 Temp. Sensor. The LM35 is a analog temperature sensor chip, pre calibrated to a linearity of 0.25C and an accuracy of 0.5C. The reason to use an LM35 is that we have an analog circuit that needs to do something based on temperature, and actually requires a variable response to a range of temperatures, not just a threshold.

For interfacing it with Arduino UNO or NANO, we would hook it to one of the pins labelled from A0 to A7. We will supply the LM35 with 0V and 5V, and hook the Analog Input pins with LM35 Temp. sensor and use analogRead() to read the desired value. Then



**ALARM BELL, RELAY CIRCUIT, BULB**

In addition we have also added an Relay circuit with a Bulb and alarm bell for the Fault detection. As soon as any fault will be detected in the Transformer circuit, the alarm circuit will work.

Working:- If any fault detected in our Transformer circuit let's say, If the Oil Level is Low, then the Alarm will beep and give a warning sound. Followed by this, the Bulb will get disconnected from the Circuit. This could be understood by the Principle of miniature circuit breaker (MCB). If any fault or High current is reported in MCB Circuit, then the MCB gets automatically Trips down. In the same way in our GSM based Transformer Circuit, when the Fault will be detected in the circuit the Bulb OR LED will also automatically cut off from the Circuit

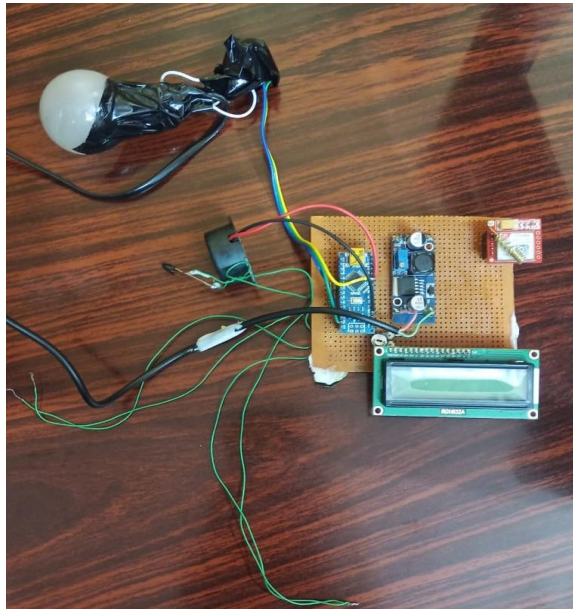


Figure 6: Alarm Bell Circuit

The above figure shows the Hardware connection of GSM BASED TRANSFORMER MONITORING SYSTEM. When the fault is detected, then the Alarm will give a buzz sound and and trip off the Bulb or the LCD used in the Alarm Circuit. After this GSM Module will start working, and will send a real time notification to the remote operator via a GSM Module. Not only this, but also as same fault will appear on our 16\*2 LCD Screen. The fault could be Low Oil Fault, Line to Earth Current Fault, Or High Temperature fault. The alarm bell will beep on each and every type of Fault. The fig 7 shows the Message or the notification received on our GSM Module after the fault being detected. The real time alert of all the 3

faults, LOW OIL LEVEL FAULT, HIGH TEMPERATURE FAULT, and EARTH CURRENT FAULT was successfully received on our cell phone or to the remote operator.

Figure 7: Message Via GSM Module

**3.BLOCK DIAGRAM**

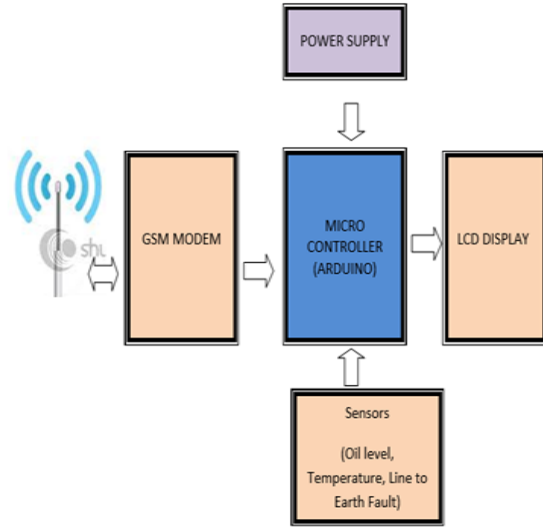


Figure 8: Block Diagram of Hardware Implementation

**4.RESULTS**

Our main Aim and Objective was to receive a real time Alert and Notification on our cell Phones through GSM Module. Same has been accomplished both on Software Project and Hardware Project.

**ADVANTAGES**

- Remote Monitoring of Transformer
- Alert sent on GSM Module
- We can measure the Various Parameters of Transformer
- Real Time Monitoring
- Real time Notification and Alert on GSM Module
- Alarm sound as soon as the Fault being detected

**5.CONCLUSION**

The GSM BASED TRANSFORMER REMOTE MONITORING SYSTEM WITH ALARM SYSTEM

ON FAULT DETECTION is a very convenient and useful device for the GSS and Electrical Engg. purpose. Our main Objective was to received the real time Notification and alert of current parameters of the Transformer, which has been accomplished successfully. Further we have also added an Alarm Circuit with relay and Bulb for the Fault Detection, where Bulb will automatically will get trip off from the Circuit as soon as the Fault will be detected followed by Buzzer sound by the Alarm.

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