Impact Factor (SJIF): 4.542

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

Volume 4, Issue 3, March-2017

"REMOTELY MONITORING OF TRANSFORMERS PARAMETERS AND PROTECTION AGAINST OVERLOAD"

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ABSTRACT - **In power system a distribution transformer is a very important device. Transformer is a electrical equipment so there are some faults occur like overloading, over-current, over-voltage, over-temperature etc. So prevent these faults we can Monitoring this parameter and give protection of transformer. The transformer parameters are monitoring by remotely through GSM modem. This system consists microcontroller of 8051 family and a rectified power supply. Microcontroller and sensors are interface through the Analog to Digital Converter (ADC). Sometimes in distribution transformer on the secondary side load is increase due to increase power consumption. When the transformer get overloading after some limit trip the transformer and give alert to the operator through GSM. Due to this over-current may be occurring and it causes the failure of transformer. Voltage, Temperature, Current of transformer can be monitored. Proteus Simulation is carried out for the parameter monitoring.**

Key word - **Transformer *Parameters, Microcontroller, Voltage, current, Temperature sensor etc.***

I. INTRODUCTION

Transformer is a most important part in the power system. Transformers can voltage step-up or step-down. In power system to monitoring transformer parameters is essential for transformer health. Here we use GSM technology to communicating parameters. Transformer is said to be faulty when an undesirable condition occur like overvoltage, over-current, over-temperature etc. Due to these efficiency of transformer is down. To avoid these faults parameter monitoring is essential. To protect the transformer from over-temperature temperature sensor is use and it give data to the operator through GSM. Voltage and current are also monitoring as the temperature and Communicate parameter through GSM. When the transformers get overloaded this device give alert to operator and after some limit transformer is trip down. In this microcontroller based protection is provided because of lower cost, small size, more reliable etc.

II. SYSTEM DETAILS

The block diagram is give idea about hardware description.

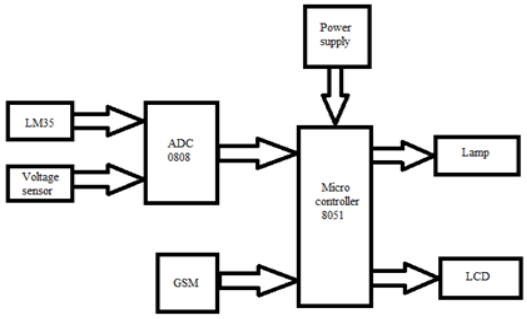

Figure-1: Block Diagram of the system

In this device numbers of components are use for protective device. The voltage sensor is used to sense the voltage of the transformer. The sense voltage and temperature is passing through the Analog to Digital Converter (ADC0808) to the Microcontroller. The Temperature sensor LM35 is used to sense the Temperature. When transformer get over-temperature, Over-voltage the microcontroller give signal to load relay and shut down transformer. The microcontroller is act as main part of this device. The GSM modem is used to communicating between the operator and device. GSM modem is give an alert to the operator of parameter to be monitoring. The LCD display is used to display the Monitoring Parameters.

III. SIMULATION RESULTS

In this we are using PROTEUS software for the simulation. Circuit diagram for simulation is shown in figure-2.

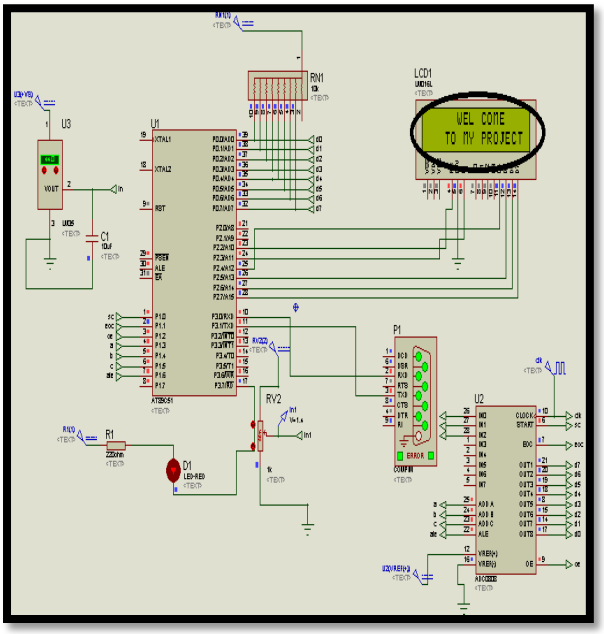

Figure-2: Circuit Diagram

In circuit operation in PORTEUS there first we push the "START" button then the LED display is glow then circuit on running condition and it indicate the "WELCOME TO MY PROJECT" is in round indication in this figure-2.

A) MEASUREMENT OF OVER-TEMPERATURE

In this operation we have select the maximum value of over temperature is 50°C. in some physical condition occur and transformer temperatures is increase then maintain value. In this condition circuit is operate and give data of the over temperature threw the terminal port is shown in Figure-3 and Figure-4.

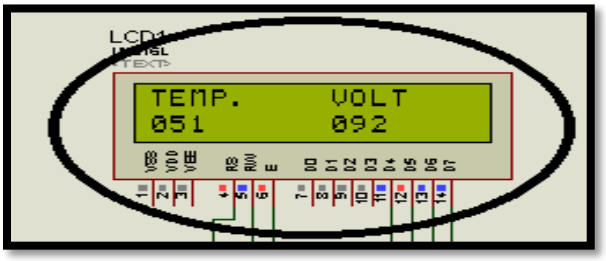

Figure-3: LCD Display Show Over-Temperature

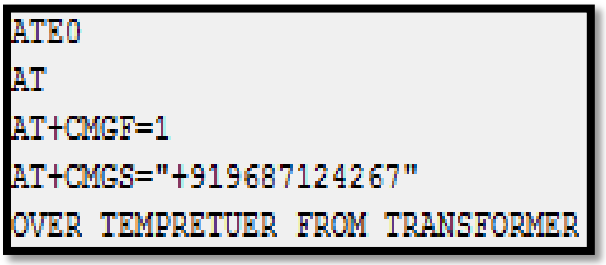

Figure-4: Message through GSM in Mobile

As shown in above figure if there are the transformer temperature is increase the value of 50°C then at that time it give a data through GSM modem to our mobile phone.

B) MEASUREMENT OF OVER-VOLTAGE

In this operation we maintain the value of maximum overvoltage is 180V. If there are some physical conditions then overvoltage occur in transformer. So it gives data of overvoltage through the terminal port is shown in Figure-5 and Figure-6.

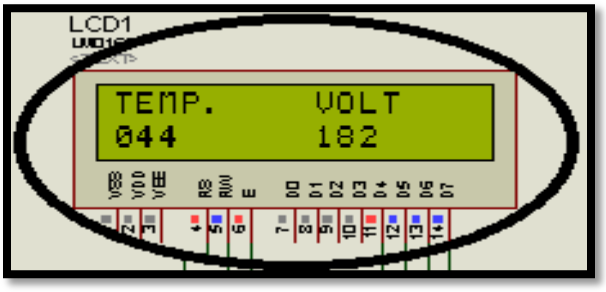

Figure-5: LCD Display Show Over-Voltage

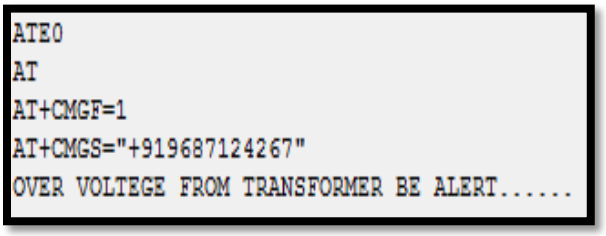

Figure-6: Message through GSM in Mobile

As shown in above Figure-6 there is the transformer voltage is above 180°c than at that time it gives data through GSM modem to our mobile phone.

IV. CONCLUSION

Protection of transformer is most important in these days. This project is focus on the monitoring and protection of transformer using microcontroller and GSM modem. This project is increase life of the transformer. At the end of this project complete software were successfully implemented as prototype. With help of this project maintenance staff can continuous monitoring on transformer.

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