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GSM BASED REMOTE MONITORING OF PARAMETERS OF TRANSFORMER

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Abstract— This Paper based on transformer parameters control & design issue by using GSM & different types of sensor. The transformer parameters is monitor now a days manually which takes too much time so, there is need to monitor all parameters of transformer like load voltage, load current, oil level as well as its temperature & body temperature of transformer in real time system. If any abnormality occurs regarding all those parameters then SMS sends to the monitoring station authorized person by using GSM & predefined program of microcontroller.

Keywords— GSM system, Microcontroller, Transformer, ADC, Real time, Monitoring station, SMS.

I. INTRODUCTION

Science & technology demands, now a days real time based system because the system based on real time save the time as well as gives accurate result. This paper gives the brief idea about transformer monitoring in real time system. Recently transformer parameter is monitored manually. Whatever parameters are measured in terms of voltage, current, temp, oil level which is not received to the monitoring station in time that's why testing operation is not fast enough.

According to the above problem there is need to monitor all the parameters control in real time system, this is possible by using GSM based system.

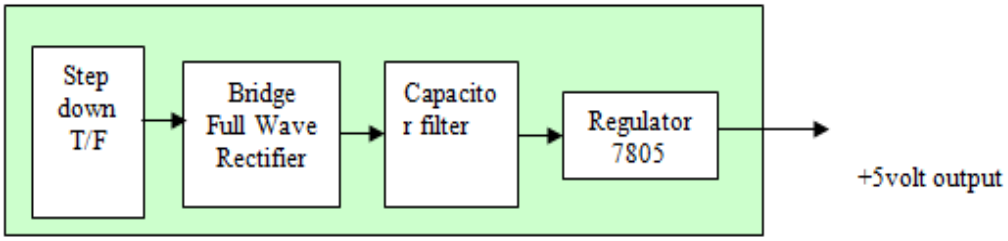

Figure 1: Power Supply block diagram

The Block diagram of the system is shown in figure 2 below.

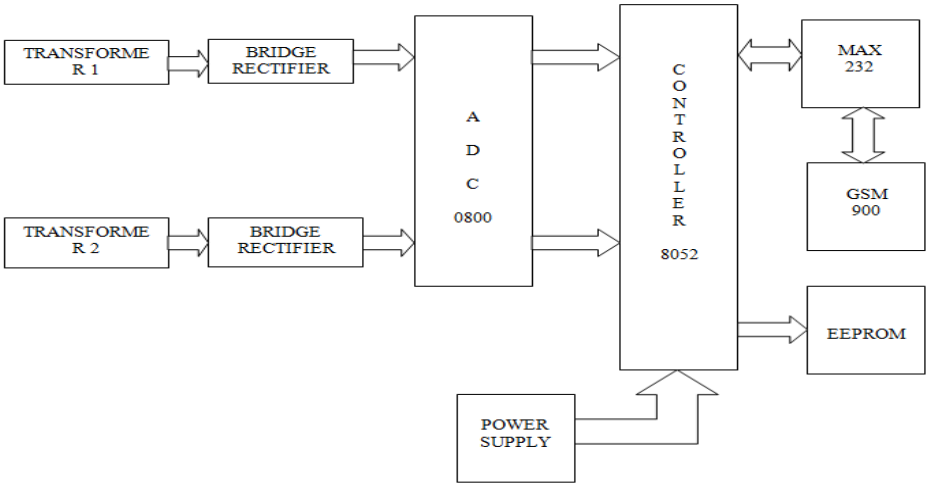

Figure 2: Block Diagram of system

II. WORKING PRINCIPLE

In hardware part of this project we are using two types of transformer, one is called main transformer & other one is load sharing transformer which are also called as master and slave transformer respectively.

When any abnormal conditions occurs inside the transformer the abnormality will be sensed by different types of sensors which will be mounted inside the transformer at respective position then load would be transfer from master transformer to slave transformer.

Load sharing is possible by using driver relay which is shown in block diagram of the system. Relay driver is an electromagnetic switch which is useful if we want to use a low voltage circuit to switch on and off light bulb connected to 220v main supply.

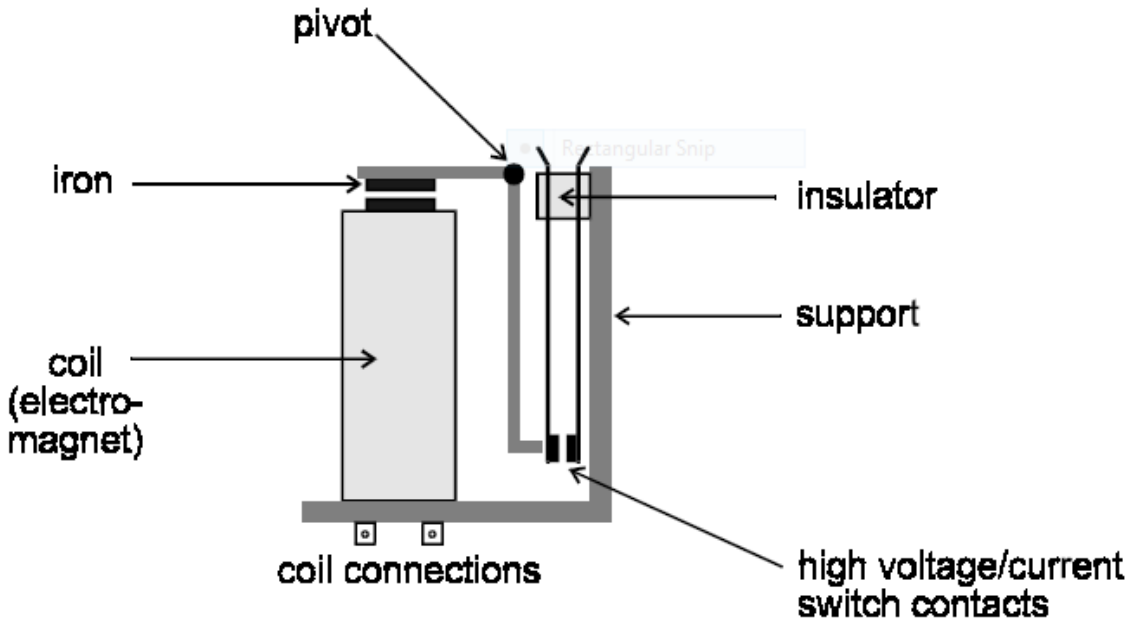

Figure 3: Driver relay

III. COMPONENTS USED

➢ **The main components used in the system are as follows.**

1. Two transformers (master & slave)
2. Microcontroller
3. Power transformer
4. Current sensor
5. Temperature sensor
6. Driver relay
7. Resistor (10k)
8. Capacitor (10 micro Farad, 33 Pico farad)
9. LCD (16*2)
10. Crystal oscillator
11. L.E.D.
12. Power supply (5 volt)
13. Regulator IC (7805)

IV. CIRCUIT DIAGRAM & DISCRIPTION (Input)

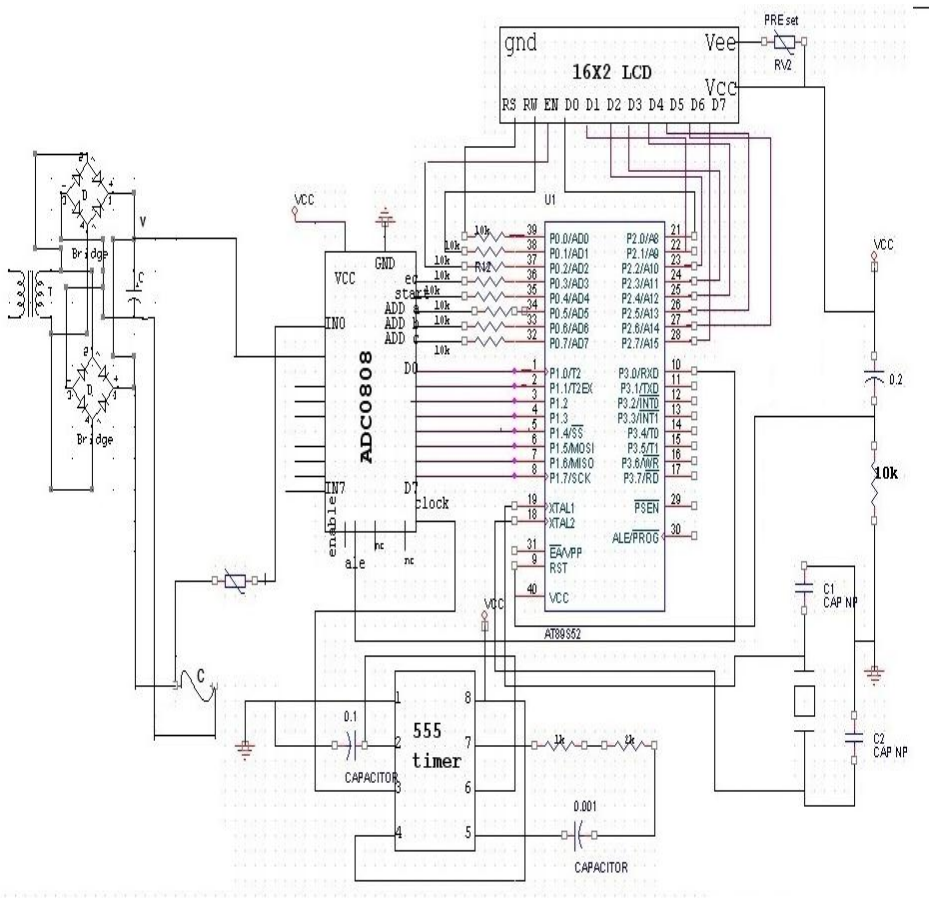

Figure 4: Input circuit diagram

V. Output Circuit

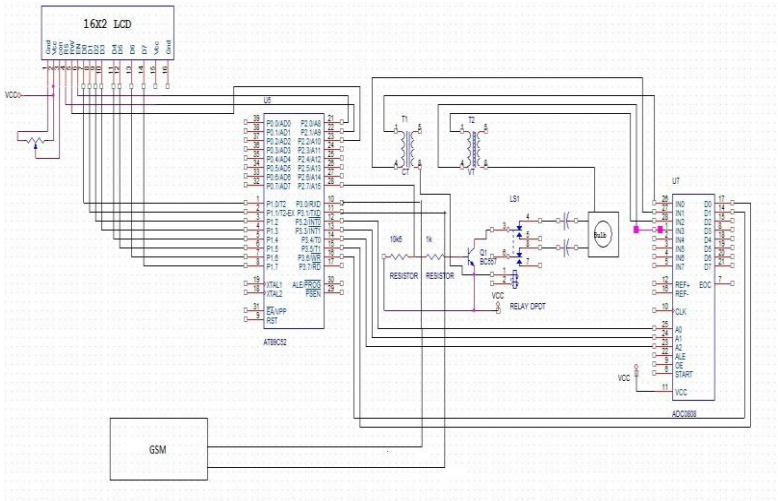

Figure 5: output circuit diagram

There are mainly three sections in the circuit diagram:-Input section, Central unit section, output section.

In input section, there are two transformers i.e. transformer 1 & transformer 2 which accepts the input of 230V, at the output bridge rectifier is connected which converts 230V A.C. into 12V pulsating D.C. There is a capacitor filter which rectifies the pulsating D.C. signal into pure A.C. signal. If the load and temperature will exceed beyond the standard value, the load will be shared

from transformer 1 to transformer 2 by using driver relay. Before transferring the load there'll be feedback sent to the microcontroller.

In central unit, there is a microcontroller. For maintaining the clock frequency of microcontroller, crystal oscillator is used which is connected to the pin no. of 18 & 19 of microcontroller.

At the output, there are GSM, EEPROM & display unit i.e. LCD of 2*16.When feedback is received to the microcontroller then load is shared towards slave transformer. Message will be transmitted to the monitoring station regarding the load sharing or temperature exceed this will be possible by using GSM 900 which is connected to pin no. 10& 11 of microcontroller.

GSM is connected directly to the microcontroller unit which is connected via. MAX232 i.e. serial communication system. EEPROM is also used at the output side. EEPROM means electrical erasable program read only memory which is used to store the particular mobile number of authorized person for receiving the information regarding the transformer health condition.

VI. ADVANTAGES

1. Automatic load sharing is possible before occurring any Castro graphic failure.
2. Process is reliable and cost effective.
3. There is no any chance for manual error.
4. Process is also called as fit and forgets.
5. Fault can be easily and accurately identify.
6. This process is also reducing the maintenance cost.

VII. APPLICATIONS

1. It used in agriculture transformers.
2. Due to heavy operation in industry where, there is a chance of overloading problem. To minimize the load this system will useful.
3. It used in remote station site of distribution transformer.
4. It can be used in power distribution stations.

VIII. CONCLUSION

This project "AUTOMATIC TRANSFORMER LOAD SHARING AND DISTURIBUTION "is designed and implemented with Atmel 89S52 MCU in embedded system domain. It is much easy and cost effective. Experimental work has been carried out carefully. The proposed method is verified to be highly beneficial for load sharing. And the output will be displayed on 16*2 LCD.

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