TRANSFORMER FAULT DETECTION AND MONITORING

G. A. Bongale[1], Suraj Girave[2], Sayali chougule[3], Pranoti Shinde[4], Apoorva Patil[5] , Shubham Patil[6]

[1]Assistant Professor, Electrical Engineering Department, D. Y. Patil Technical Campus, Faculty Of Engineering And Faculty Of Management, Talsande, Maharashtra, India.

[2,3,4,5,6] Electrical Engineering Department, D. Y .Patil Technical Campus, Faculty Of Engineering And Faculty Of Management, Talsande, Maharashtra, India.

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Abstract – This is project design for fault detection like oil level , open circuit , short circuit , temperature by using GSM modem with standalone chip microcontroller and different sensor .This is installed on the distribution side . In that parameter convert the analog signal to digital signal . In that our project the fault occur in system then the send short message to mobile phone. This is use to recognizing the breakdown causes like oil level , short circuit , open circuit , high temperature . If the value increase beyond the limit the system will shut down to using controlling unit .

Key Words: fault detected and monitoring , GSM modem , controlling .

1.INTRODUCTION :

This project is used to monitor the parameter of power transformer. It any fault is detected then It will be intermediate using a GSM technology. We have measured four basic parameters of transformer. oil level, temperature, open circuit, short circuit. we have using two sensors in this project, temperature sensor and level sensor. And we have used two circuit to show open circuit & short circuit.

Faults that occur in power transmission lines can cause an interruption of power supply. The time required to locate faults is drastically reduced as the system make & break. The master slave communicated with the mode burs protocol is implemented. Also using wireless technology, GSM, SMS is send to a responsible parson on mobile.

2. THE OBJECTIVES OF PROJECT:

 * To detect the transformer fault automatically   using sensors.

 *To convey information automatically to control room for further corrective reaction.

 *To shorten the response time in order to free transformers from break occurs on large amount of power transmitted. To maintain better stableness, accuracy and safety for the system in the country.

 * Economic development.

 * To remotely control power.

3. BLOCK DIAGRAM
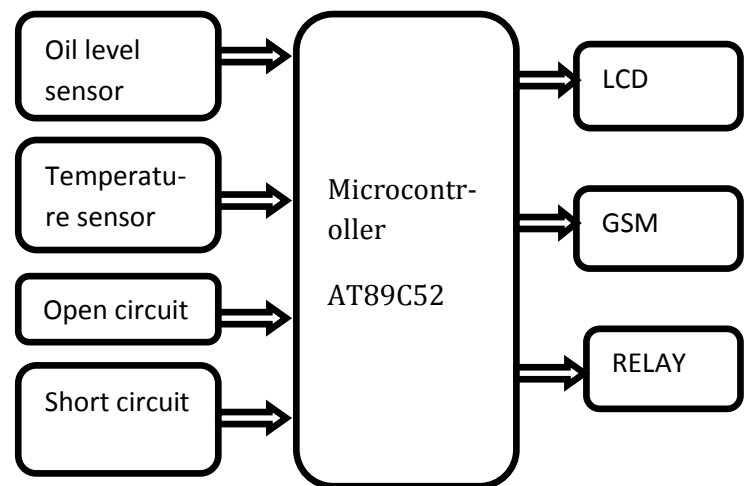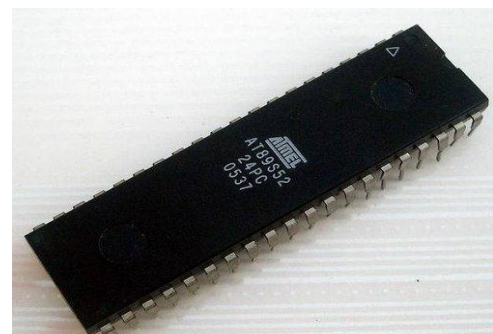

4. COMPONENTS :

4.1. MICROCONTROLLER :

fig.1.Microcontroller

The microcontroller is AT89C52 8-bit microcontroller its belong to Atmel's 8051 family. This microcontroller has 8KB of flash programmable and erasable read only memory (PEROM) and 256 bytes of RAM.

The AT89C51 and AT89C52 the difference. between the feature of are very similar in their pin configuration and operation. The difference of AT89C51 and AT89C52 have been table below

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Table :

	AT89C52	AT89C51
RAM	256 Bytes	128 Bytes
FLASH	8 KB	4 KB
NUMBER OF TIMER/COUNTER	3 16 bit each)	2 16 bit each)
NUMBER OF INTERRUPT SOURCES	8	8

The similar pin configuration of AT89C52 & AT89C51 except that first two pins. Pl.0 and Pl·l are multiplexed to correspond to timer 2 operation as given the following tables.

Table :

Existing	Alternate	Function
P1.0	T2	Timer/counter 2 external counter I/P
P1.1	T2EX	Timer/counter 2 Trigger I/P

4.2 .GSM MODEM :

fig.2 . GSM Modem

This module chip is so that we can utilize this to form a connection between the mobile and GSM system.

Sample paragraph Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, SC, DC, and RMS do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

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4.3.RELAY :

fig.3.Relay

This module are used as switches where it can open and close the circuits electromechanically or electronically. A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

4.4. LCD :

fig.4. LCD

Liquid Crystal Display is a sort of level board shows which utilizes liquid crystals in its essential type of activity ,as they can be regularly found in cell phones, TVs, PC screens and instrument boards. In proposed system 16*2 LCD is used to display current sensor values of humidity and temperature sensors

Liquid crystals do not emit light directly, instead using a backlight to produce images in color or monochrome.

4.5. TEMPRATURE SENSOR :

fig.5. Temperature sensor

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. Lower cost is assured by trimming and calibration at the wafer level.
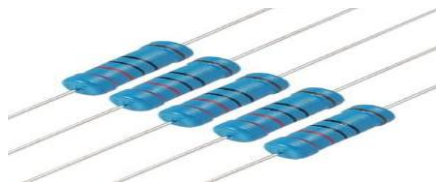
4.6. RESISTORS :

fig.6.Resistors

A diode is a device which allows current flow through only one direction. That is the current should always flow from the Anode to cathode. For 1N4007 Diode, the maximum current carrying capacity is 1A it withstands peaks up to 30A. Hence, we can use this in circuits that are designed for less than 1A. The reverse current is 5uA which is negligible. The power dissipation. of this diode is 3W.
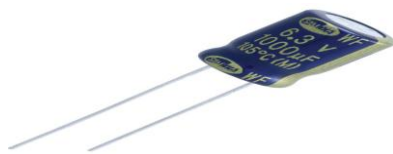
4.7. CAPACITOR :

fig.7.Capacitor

Electrolytic capacitors are used in circuits that have combination of D.C. voltage and A.C. The D.C. voltage maintains the polarity . They are used as 'ripple filter ' where large capacitance are required at low cost in small space . They are also used as 'biased capacitors ' and 'decoupling capacitors ' and even as 'coupling capacitors ' in R- C amplifier.
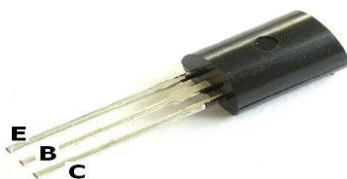
4.8. TRANSISTOR

fig.8.Transistor

A transistor consists of two pn junction formed by sand switching either p-type or n-type semiconductor between a pair of opposite type. Accordingly, there are two types of transistors namely:

- ❖ n-p-n transistor
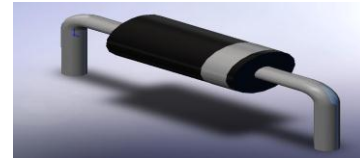- ❖ p-n-p transistor

4. 9. diode :

fig. 9. Diode

To ensure unidirectional flow of liquid we use mechanical valves in its path. By properly arranging these valves in a system we get useful devices such as pumps and locomotives. In the field of electronics too we have a valve called semiconductor diode for controlling the flow of electric current in one direction. But we use these diodes in circuits for limited purposes like converting AC to DC, by passing EMF etc. A diode allows current to pass through it provided it is forward biased and the biasing voltage is more than potential barrier of the diode.

5. WORKING:

Distributed transformer are prone to damage because of the raise in the oil temperature. When there is an overload. When the oil temperature rises, according that increases the probability of getting damages in the transformer.

The microcontroller consist of sensing unit. The gathers the essential reading like current, voltage and oil temperature within the distribution transformer. The LED display connected to the processing unit that display the respective parameter value at the substation.

The system include monitoring system which is connected to the distribution transformer for observing purpose.

The Senses overload and high current flow process in the internal winding which lead to breakdown of respective unit.

5.1. Hardware of project :
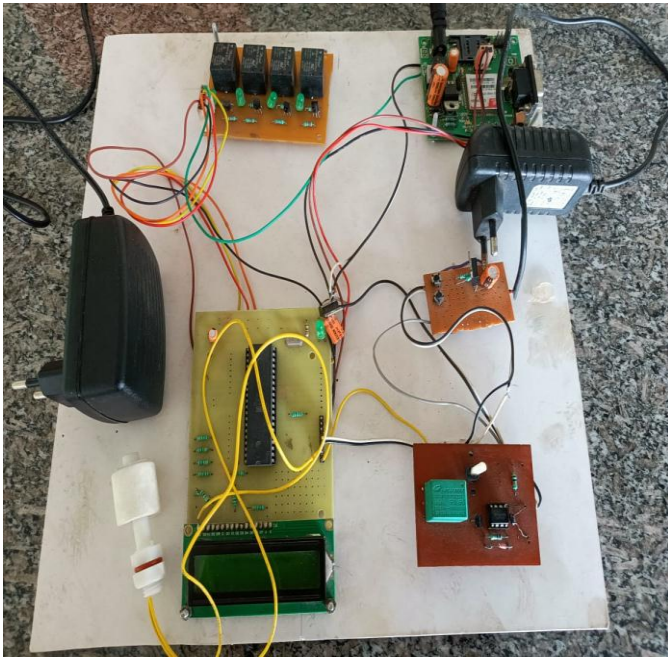
6. FUTURE SCOPE :

The following effort on this system is to give a proficient framework to identify and find the point to point flaws and point to ground flaws which can ready to give data directlyto the technical department and the specific area where issue was happened.

7. ADVANTAGES :

● It is reliable system

● It is effective than manual monitoring.

● It is recover the system time less

● Life of the equipment is increased

● No manual errors

● Remote location operation can be done.

8. CONCLUSIONS:

In that our project we are develop fault detection in transformer like load current , short circuit , open circuit , oil level , temperature.

The GSM System is very useful and reliable to manual system and also recover less time. The receiving message the action will be fast then. Fault Occur in the field because of the fault finding and send to the mobile massage.

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