TRANSFORMER PARAMETER MONITORING USING GSM MODULE

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Abstract - *This paper present transformer parameter monitoring using GSM module. The main advantages of this scheme is using through GSM module. The devious of transformer is over and done with by way of high temperature detector.GSM & Microcontroller used in wireless revelation. The reading and result of transformer like voltage, current, is not allowed by using microcontroller & send sms through GSM module.*

KeyWords: *Wireless control System, GSM Module, Microcontroller, Temperature Sensor.*

1.INTRODUCTION

A transformer is a piece of equipment used either for rising or lowers the voltage of an a.c. supply with equivalent reduces or enlarge in current. Transformer approach in all contour and size from the small balun transformers that you can place on the palm of your hand to the immense EHV power transformers that weigh quite a few metric tonnes and reside in large areas. A choice of types of transformers used in the industry like, Generator transformer, Power transformer, Distribution transformer, Instrument transformer etc.[1] However, in this project scheme, we control ourselves to protection of power and distribution transformer. A transformer will provide with as much protection as is appropriate with its voltage and power rating and the significance of its application. Ex,Over-current protection in the outward appearance of fuse may be the only fortification provide to a small 100 kVA,11/400V distribution transformer.[2]

According to the define of Transformer, it is a fixed device which transformers electrical energy as of single path to an additional path. To guard the transformer from full of atmosphere dirt and muck, it is completely together with this and oil immersed. As transformer has no revolving part, the probabilities of fault occuring in them are very rare.[2] so rare burden may be present extremely dangerous except transformer is hastily disengaged from system. This adequate automatic fortification for transformer adjacent to possible faults. Small capacity transformers used for distribution function are providing with series fuses for fortification in opposition to overloading and earth fault.[5]

In this project we will be in domination of constraint like tenderness and current, voltage. Monitor is over and done with LM35 temperature feeler, GSM & microcontroller component. Therefore, it be mandatory in the direction of stay put on scrutiny the condition while make bigger in tenderness, force as well as environmental condition. It be

logic by feeler and which is position in pointer to microcontroller. The indication is monitor as of commencement to finish GSM Module.[3]

The bringing mutually is appliance to intellect the casing tone of transformer and commencement in sequence to monitor.[1]Sheltered headset which is also a microcontroller unit. It create organization flank via locate rate and position value, but some wrong step occur next convey interested in existing person it is give you an idea about on LCD.[4]

Technological assistance broken connected to decision the an collection of scheme to organize situations of transformer by means of form of information communiqué construction as a result of the line of assail of pointed on communiqué services, reserve inspection & critique in print joined to processor and to end support embellish are bring into being significant for the scheme[3]

The society is based on transference connecting more system and exclusive of linked instrumentalist. as a result a group of move on accessible in promote like RF, ZigBee, PLC-SCADA etc. This kind of advance is pricey and functioning not consistent subsequently it be not expedient.GSM expertise are convenient designed for industry region.

In this manuscript explain the scheme work and how we will put into practice in industry substation, power plant. This scheme is a smaller amount inexpensive and put into practice in manufacturing with no trouble.

2.PROPOSED TECHNOLOGY

Transformer be a part of a set of equipment designed for reducing & increasing the current and electrical power. Transformer be key inside land area as a result it be important during broadcast and allocation set of connections.

The normal scheme in the direction of provide by means of a protect rearing used for the transformer which be distribute command in the direction of assured area since redundant contiguous. The transformer confined through graceful the transformer on or after the leading make available by means of microcontroller based relay. In irregularity situation in distribution transformer is attain pole away from each other by way of incongruity within limits similar, short circuit, snaking high temperature, oil temperature, ambient heat, bushing issue, load current issues,winding issues. as a result we are operate by way of inner issues. consequent

protection approach used for transformer is included in this expansion work.

1) Primary safeguard of transformer

2) Over-current shelter (back-up protection)

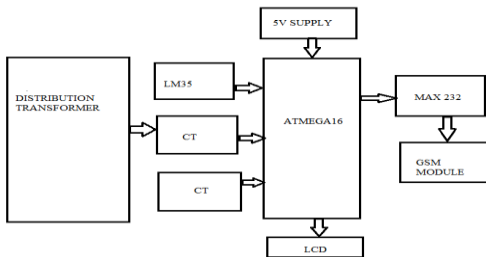3) Over-load or persistent load security by sensing oil hotness.

Fig.1

3.ALGORITHM AND PROGRAMMING LOGIC

ALGORITHM

Fig 2 show the algorithm of slab illustration.in algorithm preliminary initialization records then gsm initialization, controlling scheming data, then in regular situation the programme scuttle usual excluding within burden requirement stipulation in excess of existing be superior than warning in progress at that moment indicate excursion as well as throw sms from side to side microcontroller & excursion the path. As at the same time additional two situation occupation.
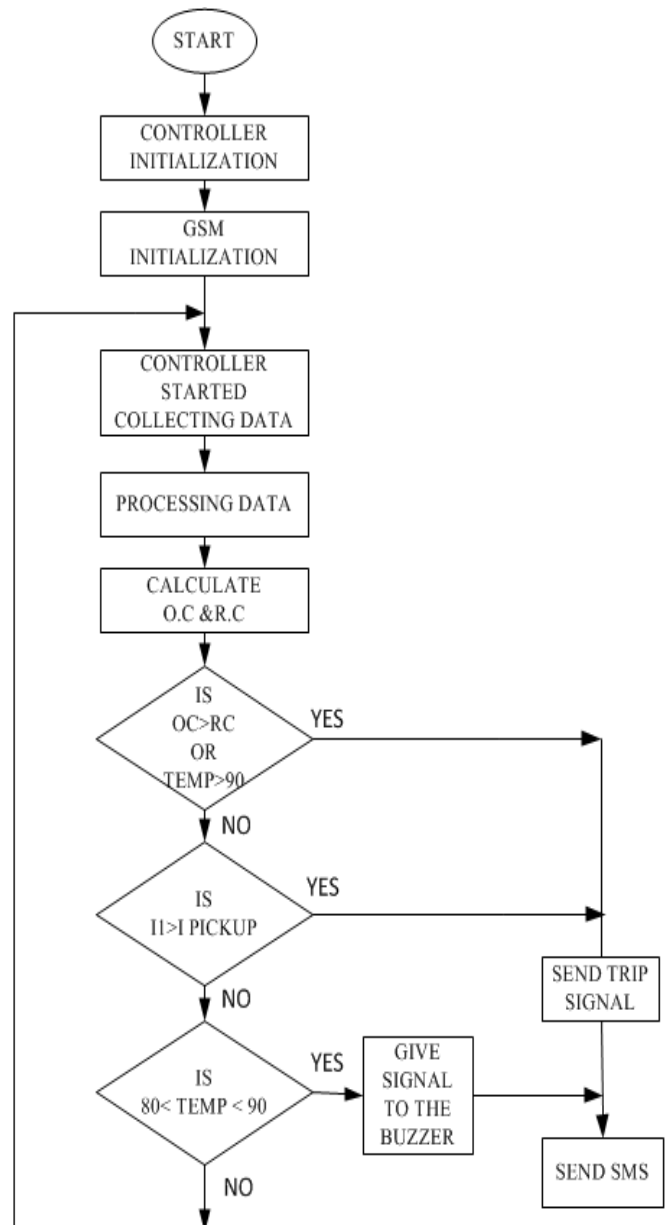

Fig.2

Any programming is achievable to estranged into four parts.

1) Simultaneously with fixed executable files

2) Compute overall variables

3) Activate critical chore of processor.(e.g. ADC, computing entrecotes as input or output etc.)

4) Foremost logic

4.RESULT -

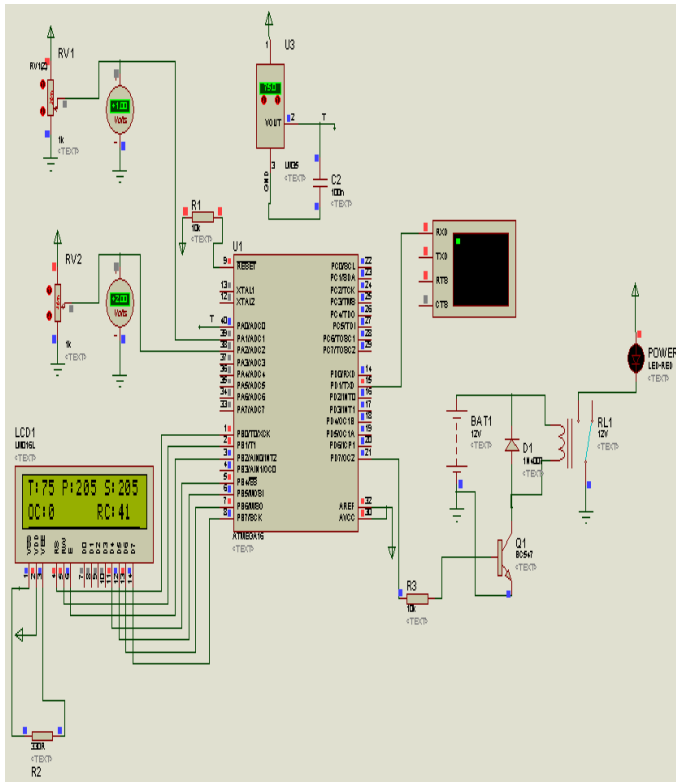### 1 SIMULATION OF NORMAL CONDITION

Fig.3 Normal Condition

Fig.3, shows the complete set up of testing performed in the laboratory. Here 1 KVA 230/115V transformer is used. The transformer is getting supply from single phase dimmerstate and supplied with resistive load. Two ammeters are connected in series with transformer, one on primary side and second on secondary side. Two CTs are connected in series on both the sides of transformer. A relay is used, it completes the circuit which provides supply to the transformer. If the relay trips, the transformer gets disconnected from the supply side. The two CTs provides the signal to the input of ATMEGA16, after certain processing ATMEGA16 checks for the abnormal condition and sends the trip signal. Also SMS will be sending on the cell phone through GSM modem.

The CTs used here are of ratio 10:1. If high voltage side current is 1 amp than low voltage side current will be 0.1 amps. The LCD reads temperature, primary current, secondary current, operating current and restraining current.

The temperature is in degree Celsius, while rests of the three quantities are displayed in the decimal equivalent. As 10 bit ADC is used maximum value 5 V is equal to 1024 decimal counts. Therefore 1 amp is equal to 243 decimal counts and 1.5 amps is equal to 307 decimal count which is set as pick-up value. As the current exceeds this value, the over-current protection operates. It happens the relay gets trip and transformer get disconnected from supply. Which can by the voltmeter reading which than reads 0 V, also the SMS about the abnormality is send on the cell phone of monitoring person.
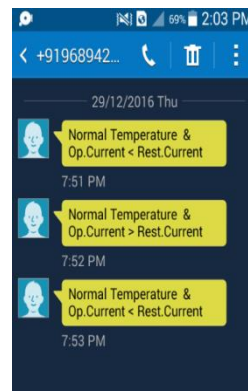

Fig.4 Hardware output

To test percent differential protection, we needed to create inter-turn fault, since it was not possible, we are manipulating the CTs burden on L.V. side, which will result in reduced voltage supplied to ATMEGA16 representing the L.V. side current. This will act as inter turn fault condition and in the calculations done by microcontroller, the operating current will exceed restraining current and trip signal will be issued and transformer get disconnected from supply. That can be seen by the voltmeter reading which than reads 0 V. and an SMS is send on cell phone.

To test the temperature sensor, we used a heating rod. Just for testing purpose we set some value of temperature as the temperature exceeded 40°C, alarm gets the signal indicated by glowing of GREEN LED And as temperature exceeds 50°C, trip signal is issued indicated by glowing of BLUE LED and messages are send according to condition.

Experimental setup

Fig 4.1 shows the experimental set up of project. 1KVA 230/115V transformer is getting supply from 230 V single phase dimmer state. Transformer primary and secondary currents are step down using two CTs which are connected in series on both the sides of transformer. These transformer readings will be supplied to microcontroller. If any fault occurs in the transformer then ATMEGA16 will send a signal to transistor, which will make it turn ON. As the transistor turns ON the relay coil will get energized and will disconnect the transformer from supply. Thus the transformer will get protected from any kind of damage.
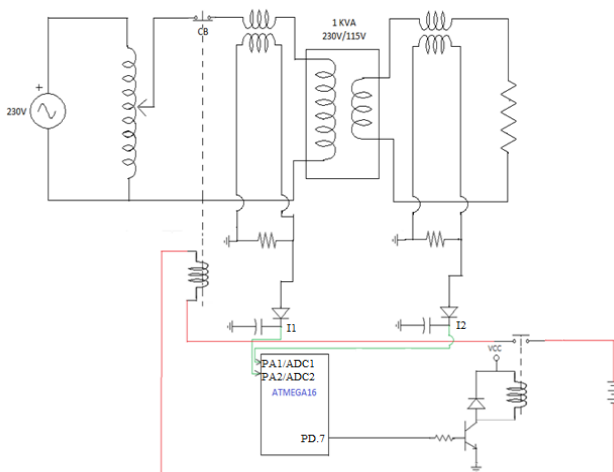

Fig 4.1 Experimental set up of the project.

5. CONCLUSION

In the midst of up-to-the-minute technology it is possible to monitor a large number of parameters of distributed transformer at a relatively high cost. In order to get effective transformer controlling system to a restrained cost, it is indispensable to spotlight on a not many key parameter. It installation on Wireless technology.

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