

TRANSFORMER TRACKING AND CONTROLLING WITH GSM BASED DEVICE

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Abstract – Transformers are a critical part of the transmission and distribution. Monitoring transformers for issues before they occur can pre-vent faults which might be pricey to repair and bring about a lack of provider. An innovative design to develop a machine for monitoring the voltage, current and temperature, oil stage, robbery of a distribution transformer in a substation and to defend the device from the cited parameters based totally on gsm that is used on this paper. Supplying the protection to the distribution transformer can be carried out with the aid of shutting down the whole unit with the useful resource of the radio frequency verbal exchange. This mobile system will help the transformers to perform easily and discover troubles earlier than any catastrophic failure. Moreover the machine presentations the equal on a laptop at the main station that is at a far flung vicinity. The proposed design is evolved for the consumer to without problems apprehend the distribution transformer that is suffered through any problems

Index Terms— Distribution Transformer, Arduino controller, GSM

I. INTRODUCTION

A tracking machine can most effective reveal the operation country or protect against scouse borrow the power, and isn't always able to screen all useful data of distribution transformers to reduce prices. Temperature and over voltage. If the boom in temperature rises higher than the desirable temperature, the tracking device will guard the distribution transformer by using issues. Consistent with the above necessities, we want a distribution transformer actual-time tracking device to stumble on all running parameters operation, and send to the monitoring centre in time. It ends in on line monitoring of key operational parameters of distribution transformers that may offer useful statistics approximately the fitness of transformers for you to help the utilities to optimally use their transformers and keep the asset in operation for a longer period. This could assist to pick out troubles before any severe failure which ends up in a significant fee financial savings and extra reliability.

II. METHODOLOGY

1. Studying literature on different transformer monitoring.
2. Studying the existing method transformer monitoring.
3. Analyze and design for the proposed system.
4. Implement the proposed design of transformer monitoring and controlling with GSM based system.
5. Carrying out experiment and evaluate the system.

III. SHORT INTRODUCTION OF UNDERTAKING

3. 1 Associated work:

1. An evaluation of these problems and various guidelines approximately the improvement of the present research paintings at the transformer tracking has been presented via alessandro ferrero. Monitoring and

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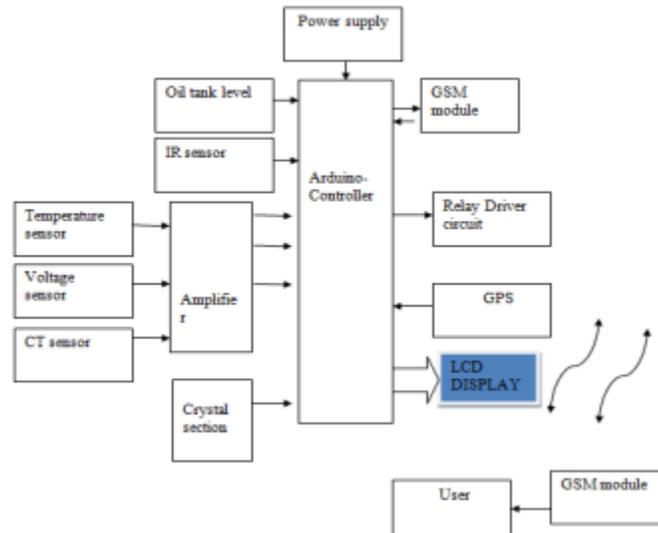
controlling of substations is an vital challenge for presenting wholesome electricity to the purchasers in this automated generation. But because of the growing old infrastructure of the distribution grids (substations) and absence of automation structures that video display units the critical conditions on the substations, the threat of blackouts, brownouts and fireplaces are swiftly growing. Substations consist of various Digital components like transformers, circuit breakers, relays and many others. The transformer fluid leaks or inner insulation breakdown reason overheating that ends in screw ups. The conventional approach includes periodic manual checking of the machine that is time eating and with very low accuracy. Additionally the substations inside the rural regions are even extra tough to monitor manually and subsequently requires more time to take respective actions.

2. Distribution transformers have a protracted provider existence if they are operated beneath suitable and crated conditions. But, their existence is notably decreased if they may be overloaded, ensuing in unexpected failures and loss of supply to a large wide variety of customers thus effecting gadget reliability. Overloading and useless cooling of transformers are the fundamental causes of failure in distribution transformers. Most energy groups use supervisory manipulate and statistics acquisition (scada) machine for on-line monitoring of energy transformers however extending the scada gadget for on line tracking of distribution transformers is an highly-priced proposition. Distribution transformers are presently monitored manually in which a person periodically visits a transformer site for maintenance and facts parameter of significance. This kind of monitoring can't offer statistics about occasional overloads and overheating of transformer oil and windings. These kind of elements can notably lessen transformer lifestyles.

3.2 Proposed system:

Dispensed transformers are vulnerable to damages because of the increase in oil temperature whilst there's an overload or huge cutting-edge flows thru the internal winding of the transformer. When the oil temperature rises, it will increase the opportunity of getting damages inside the transformers. The transformers are to be monitored very carefully for the duration of those situations. The proposed machine includes a tracking unit that is connected with the distribution transformer for the purpose of monitoring the equal. The controller consists of a sensing unit which collects the vital parameters consisting of current, voltage and the oil temperature within the distribution transformer. The virtual show connected to the processing unit shows corresponding parameter values at the substation for any technical operations. The controller additionally senses the overload and high present day go with the flow situations in the internal windings that may cause breakdown of the corresponding unit. The arduino controller is programmed in any such manner so as to continuously experiment the transformer and update the parameters at a particular time c programming language. The parameter values sensed through the arduino-controller are transmitted via the adc transmitter related to the arduino controller unit

IV. BLOCK DIAGRAM

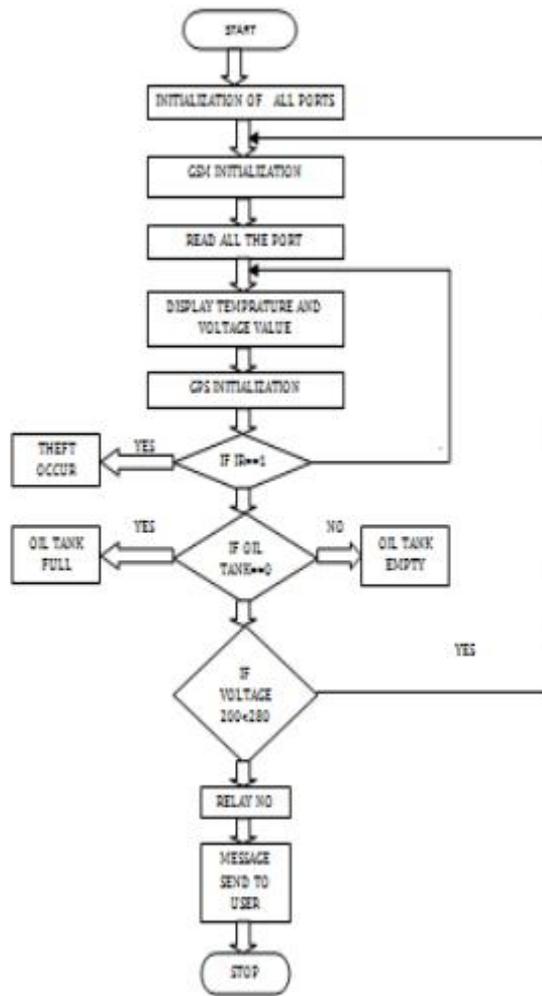


V. DESIGN OF SYSTEM

5.1 Hardware Implementation In this system, power supply is used to provide the power to the whole sensors, Arduino, GSM, GPS are the main components used for designing the system. When power supply is given system worked. Arduino is automatically interfaced and the output is displayed on the LCD display. GSM through message send to user understand mentioned parameter and location of transformer by GPS.

5.2 Software Implementation: For Software Implementation we have used the software “c”. In Software Implementation, The main part is programming of Arduino and Interfacing of each device like sensors. Once the power supply is given hardware circuit is get initialized. The Arduino interfacing with LCD display. Which display parameters info like voltage, current, temperature and tank level. When any problem occurs in transformer it will display on LCD. After display data on LCD it sends to user through GSM modem. Then suddenly data message send to user mobile so user understand which transformers problem occur.

5.3 Flow Chart:



5.4 Components of Hardware in System:

1. Sensors:

Sensors are mounted on transformer website online which reads and measures the physical quantity from the distribution transformer after which it converts it into the analog to digital. Sensor are used for sensing load current, voltage, temperature, oil stage and any obstacles. A sensor is a device which gets and responds to a signal whilst touched or condition happens in given parameters sensor. A multitude of one of a kind measurable variables may be collected for on-line monitoring. But, it's far very hardly ever useful to use the entire spectrum. Therefore, sensor technology need to be adjusted to the specific requirements of a specific transformer relying on their age and condition. Those sensors as follows

1. Those sensors have a permanent magnet inside the waft. It allows to sense the extent of oil gift in the overhead tank or sump.
2. Rtd pt a hundred for temperature of transformer.
3. For modern and voltage used model cs-sc-2 hundred.. Four. Lm358 ic 2 for ir transmitter and receiver pair

. 2. Arduino controller:

The arduino has some of facilities for communicating with a computer, another arduino, or other microcontrollers. The atmega328 affords uart ttl (5v) serial verbal exchange, which is to be had on digital pins 0

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(rx) and 1 (tx). The arduino software program includes a serial reveal which lets in simple textual facts to be despatched to and from the arduino boards. Interfacing among parameters and gsm model system

3. GSM:

Gsm changed into meant to be a secure wireless system. However, gsm is at risk of extraordinary types of attack, each of them geared toward a different a part of the community. The development of umts introduces an optional usim, that makes use of a longer authentication key to present more safety, in addition to together authenticating the network and the consumer, while gsm most effectively authenticates the user to the network (and no longer vice versa). The safety model therefore offers confidentiality and authentication, however limited authorization abilities, and no non repudiation. Inside the device any trouble of given parameters then unexpectedly message will be send to the person. To remedy trouble of transformer it's essential to send message.

4. GPS:

The Global Positioning System (GPS) is a space-based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. It provides to system location of transformers. so user understand which transformer faulty or any problem occur in distribution transformer. It reduces time to reach transformer location giving location info.

5. Power supply

The arduino want +5v dc, these specs dictate the usage of a low-price, ubiquitous linear regulator country wide semiconductor lm7805. The lm7805 requires an enter voltage of as a minimum 7. 5v that allows you to assure law, so the unregulated power supply need to supply as a minimum this voltage underneath worst-case present day consumption, assumed to be about 200ma

VI CONCLUSIONS

Transformers are a number of the most generic and high-priced piece of system of the transmission and distribution system. Ordinary tracking fitness condition of transformer not most effective is competitively priced additionally adds to extended reliability. The gsm based totally tracking of distribution transformer is beneficial in comparison to manual monitoring and also it's far reliable because it isn't always feasible to reveal always the oil degree, temperature upward thrust, load cutting-edge, voltage, robbery arise manually. Transformer is present process fault from the message despatched to cellular. We can get better the system in much less time.

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