Monitoring Transformer parameters system by using Zigbee Technology(Review)

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Abstract:

In ordinary ways all the Industrial or Electrical machineries are operated and controlled by the manual operations, so there is work in progress but sometimes there isn’t actually instant co-task between system and operator if there is emergency or faulty conditions. Hence, we are designing a system where communication exists between system and operator. For that we require Transformer, microcontroller, analogy to digital converter. As we know Distribution transformer is a major and main component of power system and its proper functioning is important for system operations. To reduce the chances of unexpected failure and happen unscheduled outage, on-line wireless monitoring has become the normal working to evaluate continuously the conditions of the transformer with it. This paper presents design review of a system to screen and operation of a distribution transformer like overload, temperatures, oil level detection. The system can be installed at the distribution transformer site and by observing and calculating above parameters it will help the utilities to desirable utilize transformers and to know the problems before any sudden great failure.

Keywords — Distribution transformer, Wireless protocol, microcontroller, over current, temperatures

I. INTRODUCTION

This Wireless monitoring and detection of distribution transformers has attracted considerable attention for since years. The main purposes are to prevent forced outages, indicate acceptable overload, evaluate the remaining insulation-life and decrease maintenance costs. To gain these strategies, the monitoring system manufacturers must work on it. Transformer is the major equipment in power system, to ensure the operation is safe and stable. "Monitoring" is here characterized as on-line gathering of information and which incorporates sensor development, estimation systems for on-line work. It is extremely complexing and costly to build the correspondence wires to screen and control every appropriation transformer station. Along these lines, we are utilizing ZigBee Module for the correspondence reason as a remote innovation.

The failures of transformers are mostly due to: Over Load condition, temperature rise, oil level detection and improper installation and maintenance. In this failure, temperature-rise, oil levels and over load, require consistent checking to save transformer life. A distributed transformer systems remote observing system builds the unwavering quality of appropriation organize, by checking basic data, for example, oil temperature, and oil level of transformer. Information are gathered persistently.

II. BACKGROUND AND LITERATURE SURVEY.

Most power organizations utilize Supervisory Control and Data Acquisition (SCADA) system for internet observing of energy transformers however broadening the SCADA system for web-based checking of dispersion transformers is a costly suggestion.

Distribution transformers are at present observed physically where a man occasionally visits a transformer site for upkeep and records parameter of significance. This kind of
checking can't give data about infrequent over-burdens and overheating of transformer oil and windings. Every one of these components can fundamentally diminish transformer life. Various methods are at present being utilized for disconnected and also web based observing of energy transformers.

III. PROPOSED TECHNOLOGY

It depends on Robust innovation meets wellbeing dependability and quickest in task. It comprises of a detecting system, flag molding electronic circuit, controller. It is introduced at the transformer site and the discovering parameters recorded utilizing the simple to advanced converter (ADC) of the inserted system. The obtained parameters are handled and recorded in the system memory. system will help the system to keep running under solid condition and distinguish issues before any disappointment. For above outcome we are utilizing a little advance down transformer of 12 V, 1 Amps rating and little knob are associated as a heap. In this task we are utilizing CT transformer for estimating load current. Likewise, we are utilizing Temp. Temperature Sensor for giving any ascent of temperature, oil level sensor is likewise utilized which recognizes any fall of oil level. The estimations of voltage, current and temperature and level of oil of the transformer is straightforwardly connected to one of the information ports of the microcontroller. Additionally, a show is associated in the information port of the microcontroller. Every one of these parameters are changed over into computerized an incentive by utilizing ADC. If the parameter estimation of the transformer is surpassed their predefined esteem then the transformer will naturally close down and along these lines transformer life will be expanded. We additionally composed Two-route correspondence here by which we can get some information about given parameter esteem just by sending Wireless Data to it so we can have watch over transformer. For this it isn't vital for the administrator to sit in the system premises which was the situation at customary system.

IV. BLOCK DIAGRAM

![Block Diagram](image)

V. TRANSISTORS RELAY LOAD CONTROL AND COOLING SYSTEM CONTROL

At that point the transistor works as a "single-pole single-throw" (SPST) strong state switch. With a zero-flag connected to the Base of the transistor it turns "OFF" acting like an open switch and zero gatherer current streams. With a positive flag connected to the Base of the transistor it turns "ON" acting like a shut switch and greatest circuit current courses through the gadget. A case of a NPN Transistor as a change being utilized to work a transfer is given underneath. With inductive loads, for example, transfers or solenoids a flywheel diode is put over the heap to scatter the back EMF produced by the inductive load when the transistor switches "OFF" thus shield the
transistor from harm. In the event that the heap is of a high present or voltage nature, for example, engines, warmers and so forth, at that point the heap current can be controlled by means of a reasonable hand-off.

VI. WIRELESS ZIGBEE MODULE

ZigBee is a determination for a suite of abnormal state correspondence conventions used to make individual territory systems worked from little, low-control computerized radios. In spite of the fact that low-fuelled, ZigBee module frequently transmit information over longer separations by going information through transitional module to achieve more far off ones, making a work organize; i.e., a system with no unified control or high-control transmitter/collector ready to achieve the greater part of the arranged module.

ZigBee is utilized as a part of utilizations that require a low information rate, long battery life, and secure systems administration. ZigBee has a characterized rate of 250 Kbit/s, most appropriate for occasional or irregular information or a solitary flag transmission from a sensor or info gadget. Applications incorporate remote light switches, electrical meters with in-home-shows, activity administration systems, and other purchaser and mechanical hardware that requires short-run remote exchange of information at moderately low rates. The innovation characterized by the ZigBee particular is proposed to be less difficult and more affordable than different WPANs, for example, Bluetooth or Wi-Fi.

VII. PC INTERFACING

In the receiver, the ZIGBEE module can be utilized as recipient. This module gets the information send by the transmitters. The supply to the ZIGBEE module (3.3V) is given by the supply hardware in fig with LM317.

To interface with the PC, we need to change over the TTL logic into RS232 logic, for this reason we utilize the IC MAX232. MAX232 is a double driver/beneficiary that incorporates a capacitive voltage generator. The drivers (T1 and T2), additionally called transmitters, change over the TTL/CMOS logic input level into RS232 level. The transmitter (pin 10-T2 in) take contribution from ZIGBEE's information out (pin 2 of ZIGBEE) and send the yield to RS232's recipient at pin 7 (T2 out) of MAX232. We utilize four capacitors, two for multiplying the voltage and other two for modifying the voltage. The capacitors are associated between pin 1 and pin 3, pin 4 and pin5, pin 2 and VCC, and pin 6 and GND. The transmitter yield (T2 out) from MAX232 (RS232 logic) is associated with pin 2 (get information) of RS232 port. In this manner, the information got are given to PC. The pin 5 of RS232 port is associated with ground.

VIII. CONCLUSION

In present days innovation it is conceivable to screen an extensive number of parameters of distributed transformer at a generally high cost. The test is to adjust the
elements of the checking system and its cost and unwavering quality. Keeping in mind the end goal to get compelling transformer observing system to a direct cost, it is important to centre around a couple of key parameters. Remote transformer parameters checking system can record and send anomalous parameters of a transformer to concerned office. It deals with Wireless innovation.

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