AN OVEREVIEW OF XBEE BASED TRANSFORMER MONITORING

VANDANA N. LAHANE
Department of E&TC, Deogiri Institute of Engineering and Management Studies, Aurangabad (M.S.), India
Vandanalahane.77@gmail.com

MR. G. S. LIPANE
Professor, Department of E&TC, Deogiri Institute of Engineering and Management Studies, Aurangabad (M.S.), India, gajananlipane@dietms.org

ABSTRACT

Artificial neural network applications are developed on very wide range in recent years. Development of the cities and industries leads to the need of remote monitoring for devices, processes and systems. X-bee technology was found suitable for two way communication and hence suitable for monitoring of the transformer. The transformer in the faulty conditions will have to be monitored to avoid the effects. The transformers are widely spread in various areas of the countries and hence remote controlled monitoring and protection can't be avoided. Authors are trying to present an overview of the X-bee technology implemented for the monitoring of the transformer. Monitoring more than one device at a time is the key feature of this technology.

KEYWORDS: XBEE, Transformer, Microcontroller, Sensors, Monitoring of Transformer, etc.

INTRODUCTION

The various approaches of the transformer monitoring has been proposed by the researchers in last decade. The transformer being heart of the power system is very vital device of electrical distribution and transmission. Continuous monitoring of the transformer is needed for improving the performance parameters of it. Better the working of transformer leads to improvement in the performance of the whole distribution system.

Manual monitoring is found not suitable as the transformers are installed on the various locations. The basic principle of the system is to control the performance parameters by comparing them with the various preset permissible values of the parameters. If any instantaneous value is crossing the permissible value the system automatically protects the device or removes the device from supply in order to protect it if the values of the parameters are suddenly increased. The difficulty with the normal communication system is the huge numbers of the transformers installed at the various locations in various conditions. The cable communication is highly impossible if feasibility is considered. Hence the need is fulfilled by the X-bee technology.

The X-bee technology helps in achieving the goal of remote sensing the transformer parameters to sense and record it. The proposed block diagram of the system is shown below. The heat produced in the transformer must be monitored as it causes the direct effect on the parts of the transformer like winding and insulation.
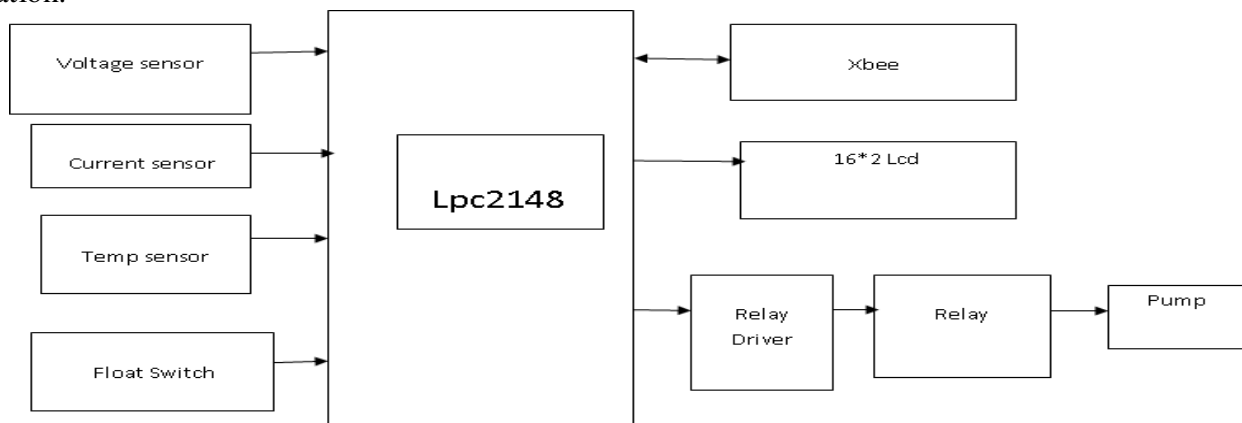
Fig.1: Block Diagram of Transformer Health Monitoring

The voltage, current, & temperature sensors are used to sense the parameters of the transformer. The continuous monitoring is achieved with the inputs received from the sensors. Step down transformer, rectifier and voltage regulator are used to supply to the microcontroller and other sensing and controlling devices. The sensed data is fed to LPC2148. The microcontroller with inbuilt ADC converts this data to the digital signal and compares it with the parameters expected in the normal operation of the transformer. In case of the faulty conditions sensed, the microcontroller sends the controlling command and closes the system. All the communication right from data is performed with the help of X-bee technology.
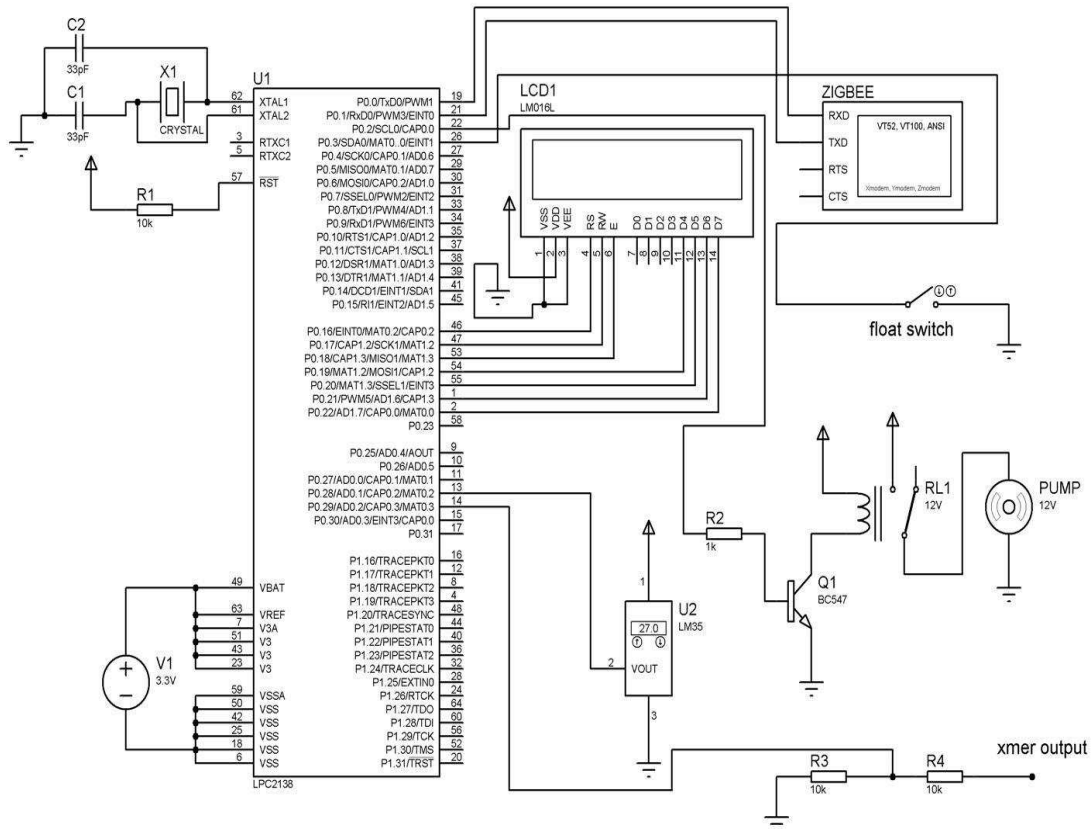
Fig.2: Proposed system for XBEE based transformer monitoring

COMPONENTS USED IN THE PROPOSED MODULE
- Microcontroller':Lpc2148
- 16*2 LCD Display
- Relay Driver circuit
- Voltage Sensor
- Current Sensor(ACS712)
- Temp Sensor (LM35
- Fluid Switch
- Pump
- Software - Keil , Flash Magic

CONCLUSION

X-bee technology found very suitable for monitoring, & observations of the electrical devices installed at remote locations. The remote locations may not have the humans to monitor the devices and hence it is necessary to monitor such devices from one place and continuously. The two way communication is made possible with artificial intelligence and artificial neural network. The proper and timely communication added the advantage to the decision makers of the monitoring centre to make the devices working and running conditions better. Overview of the X-bee technology for protection of the transformer is the key focus of this paper.

REFERENCE

I.   Vishwanath R ,Akshatha V, Shetty " *A New Approach to monitor Condition of Transformers incipient fault diagnosis based on GSM & XBEE " © 2015 IJEDR | Volume 3, Issue 2, p.p. 2-6*

II.   Rakesh Kumar Pandey, DilipKumar, "*Distributed Transformer Monitoring System Based On Zigbee Technology", IJETT, Volume4 Issue5- May 2013*

III. Mallikarjun Sarsamba, Dr. Raju Yanam shetty & Prashant Sangulagi, " *The Load Monitoring and Protection on Electricity Power lines using GSM Network", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 3, Issue 9, September 2013 ISSN: 2277 128X.*

IV.   Santosh G. Kashid, Bira Bhivatambe et.al, "*PLC Based Transformer Fault Detection And Protection" Conference Proceedings of A National Conference on "Modern Trends in Electrical Engineering" (NCMTEE-2K17) 27th March 2017, Novateur Publication's International Journal of Research Publications in Engineering and Technology (ISSN No: 2454-7875)*

V.   Mr. Manish Kumar, Prof. P. Dhabe , Prof. Sagar Lanjewar, Er. Pramod Patil , "*An Intelligent Stipulation Monitoring System For Industrial Motor", JournalNX - A Multidisciplinary Peer Reviewed Journal, Volume 3 Issue 11 , Page No. 26-28*

VI.   Ali Kazemi& Casper Labuschagne ,"*Protecting Power Transformers From Common Adverse Conditions", paper presented at the Ga-Tech and the Western Protective Relay Conferences, New Berlin" in 2005*