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Intelligent Energy Saving Using Wireless Sensor Network

Rupesh D. Chaudhari
Dept.of E&TC
Government college of Engineering,Jalgaon

Prof. M. R. Dhotre
Dept.of E&TC
Government college of Engineering,Jalgaon

Abstract:- This paper intended to provide Intelligent Energy Saving System which can be used for reducing energy consumption and it is used in places like where lighting is important. The libraries will be well illuminated with many lamps and it is also used in industry for temp control and also for humidity control .The LDR senor is used in dark or light sensor circuits..
The LDR sensor have very high resistance but when it is illuminated with light the resistance drops and microcontroller switch on the bulb in node section the command send by server section.The temperature sensor have temperature in calculate degree celcius, if normal temperature goes above threshold value then fault occur which is given to microcontroller and microcontroller send command to switch on fan and cool down the system. The existing system have lots of energy consumption because of manual control over the system and data does not store. the waste of time and energy in existing system then we use proposed system for monitoring sensor data which is transfer by node section. The sensor data transfer to server through zigbee and the collected data posted in web server using GPRS.

Keywords: *Microcontroller(LPC 2148),GSM Module,Zigbee transceiver, Lcd display, temperature sensor,humidity sensor,LDR sensor.*

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I. INTRODUCTION

The amount of user data may be stored or processed doubles every two years. This fact raises several problems such as data management because every day data size increases and time-critical data processing tasks. In order to handle these issues, the researchers from all over the world are concentrating their work under the topic "big data". If we are talk about big data research, we consider new approaches for the processing of large amounts of data from different, heterogeneous sources. There are some Key problems include search strategies, data dissemination, automated analysis as well as the visualization and post processing. Big data environments in a traditional manner deal with massive, centralized computing resources, high performance computing centers and high-speed storage systems. Typical scenarios focus on data mining scenarios, fraud detection and scientific data evaluation as well as pattern recognition. The embedded system is a computer system in which the dedicated function. It is a personal computer, an embedded system performs the one or a few predefined tasks and there are specific requirements. The system is dedicated to a specific tasks and the design engineers can optimize it, reduce size and cost of product. Embedded systems are often mass-produced, benefiting from economies of scale.

The majority of research and development activities in this field focus on to the existing information is in large volumes than the amount of data usually handled with relational database systems. Today, the researchers all over the world are focus actual research changes rapidly. There are Several big data projects deal with large amounts of multi-dimensional data in embedded and distributed systems. Accordingly, the different application context requires different strategies. For example, if we consider that the next generation driver assistance systems, Vehicle-2-Vehicle concepts, the large amount of sensor data is generated and needs to be fused. Additionally, distributed scenarios, the evaluation and classification of data is received by imaging systems these are local preprocessing techniques. The scenarios address sensors and data monitoring systems as well as smart metering which are operating in a highly integrated and connected environment[4].

II. FRAMEWORK AND SYSTEM ARCHITECTURE

The following circuit diagram shows that the node section. The proposed system main having elements are microcontroller,max232, power supply, zigbee and sensors.

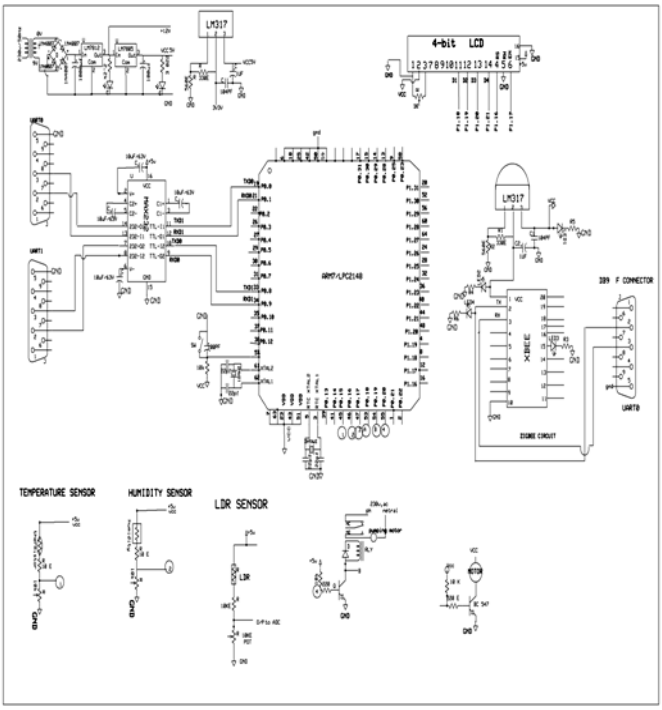

Fig.1.circuit diagram of Node section

We required 12V operating voltage for ARM controller board. Hence the ARM board require 12V D.C. power supply. The transformer to step down voltage from 230V ac to 9V ac and regulated 12V is generated. Here step down a.c. voltage is being rectified to d.c. by using 1N4007 diodes. After rectification the obtained rippled d.c. is filtered using capacitor filter. Now the filtered D.C. voltage is fed to the Voltage Regulator. The voltage regulator allows us to have a Regulated constant Voltage which is of +12V. the voltage regulator is used to regulate the d.c. voltage. Now the output node section is fed from microcontroller board to supply operating voltage.

UART0 connected to zigbee transceiver. temperature sensor connected in port 0 of port 0.28 and humidity connected to port 0.30.energy meter connected to pins 23.the opto-coupler connections of pins P0.13,P0.14 and P0.15. The LCD interfaced to microcontroller in port 1 of port 1.16 to port 1.21.

The circuit diagram of server section shows that the gsm module is connected to microcontroller and max232 also connected to microcontroller.

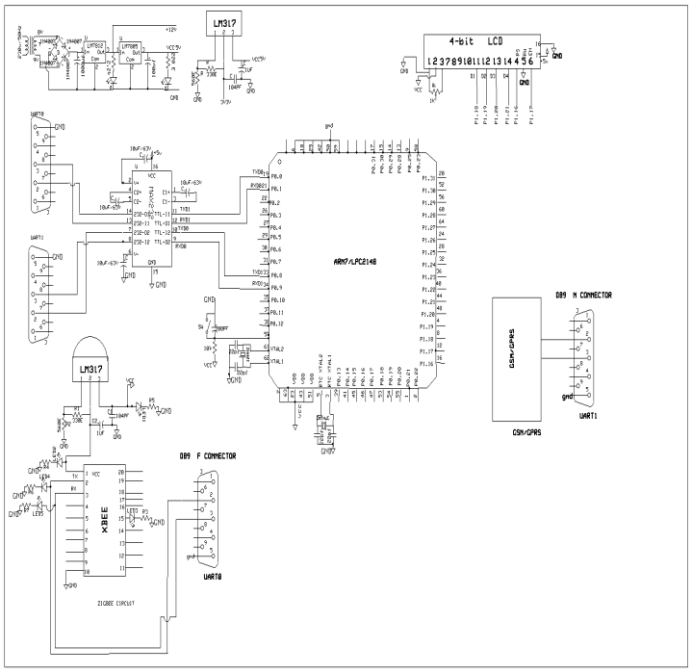

Fig.2.circuit diagram of server section

In server section gsm model is connected to UART1 and the LCD interfaced to microcontroller port 1 of port 1.16 and port 1.21 and zigbee transceiver connected to UART 0.

III. SYSTEM PERFORMANCE

In this paper we have three sections in section1 we have sensors and zigbee transceiver.

STEP 1: The system which is to be initialize & power supply will be given to the system through bridge rectifier circuit.In this we are getting the status of sensors and transmitted to the sections using zigbee wireless communication. sections will receive the information and upload it into internet server using gprs.

STEP 2: The nodes have different sensors like temperature sensor which Values are calculated for output in mv, normal temperature in degree Celsius and threshold in degree. If normal temperature goes above threshold value then the fault is occur which is in then given to the controller & controller will send command to switch on the fan to cool down the system. And if normal temperature is below threshold then the system is OK so no need of controlling only we can monitor the values of temperature. and Humidity sensor is used to sense the moisture level present in air and LDR sensor is very useful in light/dark sensor circuits. They are illuminated with light resistance drops & controller switch on the bulb at the node section by sending command through the monitoring side.

STEP 3: The system uses compact circuitary built around LPC 2148 microcontroller programs are developed in embedded c. flash magic is used for loading programs into microcontroller because critical parameters cannot detect serially so required parallel system for this purpose multi-core embedded system is required.So, the implemented system which is based on three controllers and used for critical & non-critical cluster communication. the critical cluster contains three sensors have humidity, temperature and non-critical contains LDR sensor. these sensors are work independent and successfully implemented.

Critical cluster is communicated with server for the location of fault with this proposed system, we successfully present the work done in development of system fault diagnosis[9].

IV. EXPERIMENTAL RESULT

In this experiment node have different sensors and these sensors information will be transfer into the server through zigbee. The following fig.3 shows that
Node section

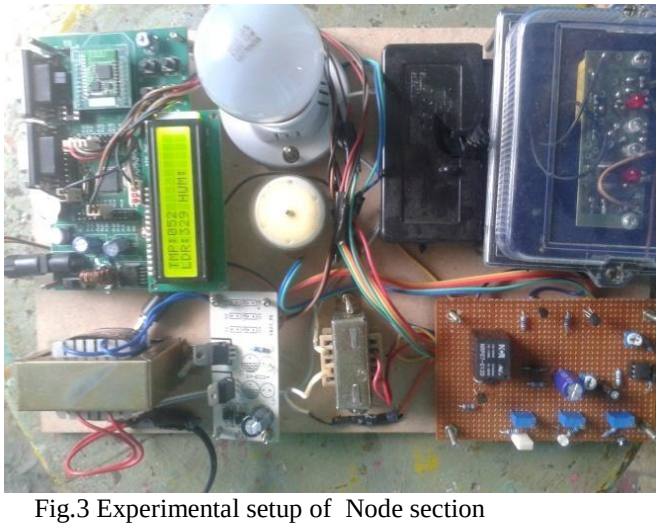

Fig.3 Experimental setup of Node section

In this section readings of sensors will be display on LCD display and energy meter for display the voltage & current ratings.

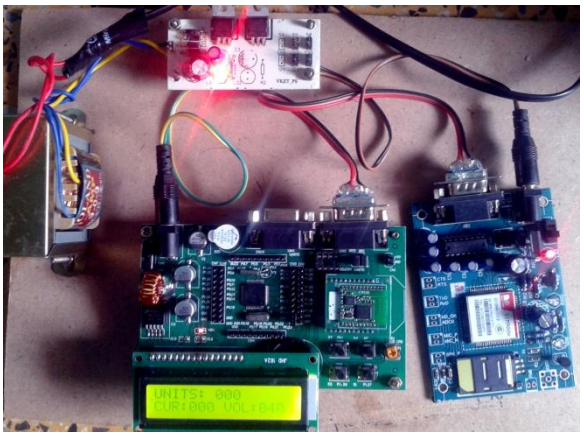

Fig.4 Experimental setup of server section

In this figure 4 shows that the sensors information transfer from node section through zigbee transceiver and display on LCD of server sections.

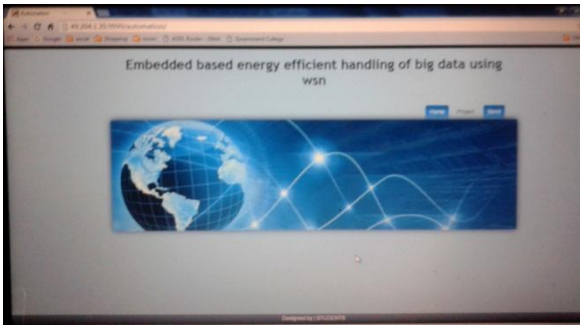

Fig.5 web server

The fig.5 shows that web server to display the values of sensors. This values are continuously updated and these values are posted on web by gsm module.

V. CONCLUSION

In this paper we introduce that the energy consumption is more in existing system. The data storage and data monitoring is not possible in existing system. So, proposed system use to reduce energy consumption and intelligent energy saving system use to save energy & time. the sensors data collected in server section and collected data posted on gprs.

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