Power Management Of Building Using ARM

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Abstract- *The wasting of power can be reduce by implementing this project. This project does the proper power scheduling by means of microcontroller, programming and by maintaining proper threshold value. When power increase tbove this threshold value, the microcontroller starts scheduling. Firstly it minimize the power of unnecessary load, if power is stabilize then there is no need of time scheduling. But nif power is not stabilize then it starts time scheduling and shut off the unnecessary load.*

Keywords- ZigBee, Curent Transformer, Potentiel Transformer, Micro Controller ARM.

I. INTRODUCTION

A smart grid is a digitally enabled electrical grid that gathers, distributes and acts on information about the behavior of all participants (suppliers and consumers) inorder to improve the efficiency of electricity services or it is a technique used to increase the connectivity, automation and coordination between the suppliers, consumers and networks that perform either long distance transmission or distribution. The objectives of smart grid are fully satisfy customer requirements for electrical power, optimize resources allocation, ensure the security, reliability and economic of power supply, satisfy environment protection constraints, guarantee power quality and adapt to power market development. Smart grid can provide customer with reliable, economical, clean and interactive power supply and value added services. Electricity losses in India during transmission and distribution are extremely high vary between 30 to 45%. For residential consumers' class, the representative daily curves by utility and by consume range were defined. For each utility, the singular ranges were grouped and were finally: 0–50; 51–200; 201–300; 301–400 kWh/month. Fig. 1 shows and curves for one of these ranges residential power utilization in 24 hours. The proposed system with effective solutions for multiple problems faced by India's electricity distribution system such as varying voltage levels experienced due to the varying electrical consumption, power theft and transmission line fault for single phase electricity distribution system also various techniques used for the energy optimization along with the detail mathematical model of consumption scheduling algorithm using linear programming method are mentioned.

II. PROBLEM STATEMENT

Design a Power management system for a building. This system is based on WSN by Using this system intensity of light use can be adjusted according to its application. We use microcontroller LPC2138 for interfacing purpose.

The zigbee module can use for wireless communication between Computer and Microcontroller .The computer is used for showing use of power management system for effective use of available power.

III. PROPOSED SYSTEM

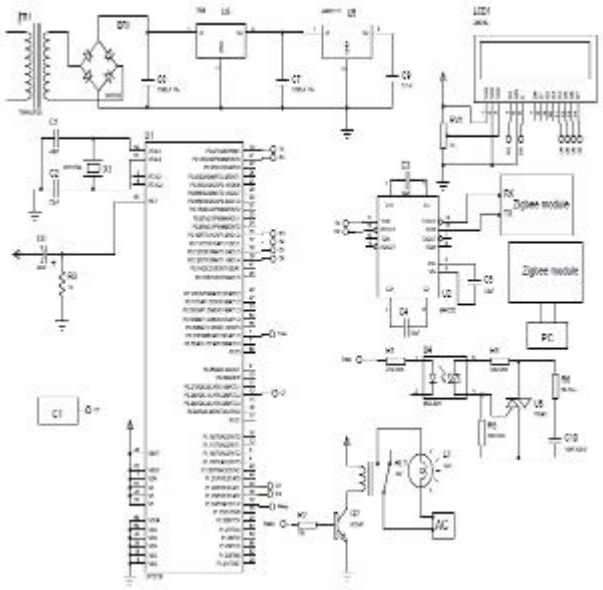

Fig 1. Circuit Diagram

Figure shows the functional description of the system to monitor electrical parameters and control appliances based on the consumer requirements. The measurement of electrical parameters of home appliances is done by interfacing with fabricated sensing modules. Current Transformer sensor is step down transformer and Potential Transformer sensor is also a step down transformer. The output signals from the sensors are passed through signal conditioning block for analog to digital conversion. These processed signal passed through controller and then it is integrated and connected to ZigBee module for transmitting electrical parameters data wirelessly. The ZigBee modules are interfaced with various

sensing devices and interconnected to have reliable data reception at a centralized ZigBee coordinator. The maximum distance between the adjacent ZigBee nodes is less than 10 m, and reliable sensor fusion data has been performed. The ZigBee coordinator has been connected through the USB cable of the host computer, which stores the data into a database of computer system. The appliances are controlled either automatically or manually. The smart power metering circuit is connected to mains 230 V/50 Hz supply.

By monitoring consumption of power of the appliances, data are collected by a smart coordinator, which saves all data in the system for processing as well as for future use.

The parameters will be entered in the data coordinator in software from appliances include voltage, current, and power. These parameters will be stored in a database and analyzed. Collected data will be displayed on the computer through graphic user interface (GUI) window so that appropriate action can be taken from the GUI.

Energy Optimization Technique:

For non-shiftable appliances such as TV and fridge which have fixed power requirement and operation period, the optimization will ensure continuous supply of power. The scheduling optimization will be carried out mainly for the shiftable appliances. For time-shiftable appliances, such as washing machine, the smart meter will be able to control the switch and provide sufficient electricity during the scheduled periods.

For power shiftable appliances, such as water boiler and electric vehicle chargers, the smart meter will schedule flexible power and ensure the total supply.The system can be further extended to multiple users' scenario where many smart meters are connected together and they agree to achieve a cooperative scheduling. The central control node will take the overall responsibility of scheduling the whole network and assigning individual meters their corresponding tasks.For non-shiftable appliances such as TV and fridge which have fixed power requirement and operation period, the optimization will ensure continuous supply of power.

The scheduling optimization will be carried out mainly for the shiftable appliances. For time shiftable appliances, such as washing machine, the smart meter will be able to control the switch and provide sufficient electricity corresponding to the power pattern during the scheduled periods. For power shiftable appliances, such as water boiler and electric vehicle chargers, the smart meter will schedule flexible power and ensure the total supply.

The system can be further extended to multiple users' scenario where many smart meters are connected together and they agree to achieve a cooperative scheduling.

Proposed work:

The proposed system with effective solutions for multiple problems faced by India's electricity distribution system such as varying voltage levels experienced due to the varying electrical consumption, power theft and transmission line fault for single phase electricity distribution system.

IV. RESULTS

Fig.1

Fig.2

Fig.3

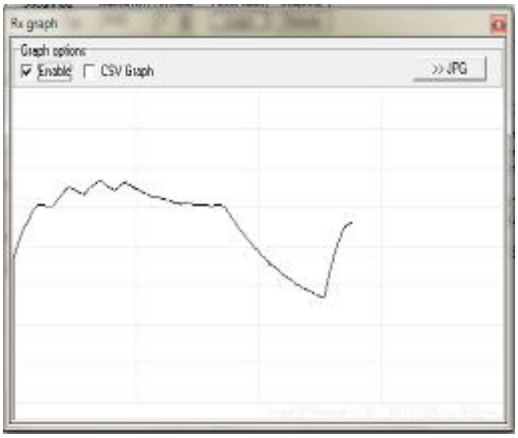

Fig.4

Fig.1 shows the entire system design of the Project. In which component connected as per the circuit diagram and the laptop on which we can see the wave form of power use by using Terminal Software.

When Power is greater than 90W (Fig.3): When we applied power to circuit and two load(light) first the microcontroller checks the how much the power the two light uses by glowing both light and if the use of the power is greater than 90 W then it try to minimize the power by diminig or by reducing the power of one light.

When Power Is Less Than 90W(Fig.2): In first case by reducing the power of one light the value of power use cannot go below 90 W threshold value. Therefore it OFF the second light to reduce the value of power use below 90 W and the graph of power use become as shown in graph.

V. CONCLUSION

This proposed architecture is an effective solution for monitoring and optimizing energy utilization. The system design mainly concentrates on single phase electric distribution system, especially suited for Indian scenario. The system provides the solution for some of the main problems faced by the existing Indian grid system, such as wastage of energy. The proposed integer linear programming based optimization mechanism for the home demand-side management in smart grid is able to schedule the optimal power for power-shiftable appliances and timeshiftable appliances respectively.

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