

Effective Energy Conservation using Home Automation

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Abstract:-This paper deals with the energy conservation and efficient home automation system Energy demand in various sectors like agri, domestic, commercial and industrial have been increases continuously and placed extra pressure on resources available on earth Resources depletion & increasing pollution of environment leads to unbalance between supply & demand gap. Energy conservation is the best method to reduce energy consumption. For proper planning of energy usage and its supply resources in every country is tough job .Hence to overcome this its need to be proper utilization and consumption of energy require. This paper deals with simple method to conserve electrical energy for commercial and domestic units .

Keywords:- Conservation,Energy efficiency, Home automation ,microcontroller.

I. INTRODUCTION

Nowadays, an energy saving is crucial for every commercial. We use electricity in our daily life such the use of lights, fans, etc. From researches, cooling and lighting as well as heating can comprise of 60% of the energy consumed of each Commercial sector. As we use more energy, we consume more electricity; we need to spend more expense on it. Main aim of energy conservation is to minimize energy cost/waste without affecting production & quality. In this work, develop an energy saving system using an intelligence technique. Microcontrollers are heart in our prototype and have a program to control the usage of electric appliances in the buildings. Though it is not a Novel idea in overall, it is a good start to show the employment of a embedded system with the intelligent technique for building a smart home. In fact, it can less expensive to be built using many existing free demo software. Also, with the prototype, it is easy to save energy and money for future.

II. PROPOSED WORK

This paper deals with a very simple idea on energy conservation. There are many existing works that present the smart home idea. The article presents benefits of the Controls intelligently. The work in focuses in the energy consumptions. In another level, the work in proposed the energy minimization in the view of instruction set design. There are many interests in designing circuits that optimizes the power/energy consumption as well as the power estimation. Current transformer and potential transformer are in input side

for load monitoring. Microcontroller is connected in between input and load side through relay.ir sensor detects persons entering in room and give signal to microcontroller to turn on/off lights. And by temperature sensor we regulate fan speed. These helps to conserve the electricity. Also paper gives important information about current source's in India and consumption.

III. RESERVES AND POTENTIAL FOR GENERATION

A. Coal and Lignite

- India produces energy mainly from Thermal resources includes coal as main source.
- The states like Jharkhand, Chhattisgarh, Odisha Maharashtra having 99% coal reserves
- Till 31st march 2016, Jharkhand state having maximum reserves about 27%.

B. Petroleum and Natural gas

- Estimated Crude oil till march 2016 = 763.48 MT
- Maximum reserves are in western region of India which is about 93.67%.
- For natural gas ,it will from eastern region having 37%.

C. Renewable energy sources

- Renewable energy mainly comes from solar, biomass, small hydro and cogeneration bagasse.
- The total estimated potential for renewable is 896603 MW out of which 17,538 from biomass & 748990 MW from solar & remaining from cogeneration.

IV. ENERGY CONSERVATION AND ITS IMPORTANCE

Effort to reduce the consumption of energy sources is called energy conservation. Energy consumption reducing with the help of effective use of energy.

A. Importance

- Help to save money
- Mitigation of environmental issues & social problems like carbon emissions.
- It helps to increase productivity & lifespan of equipment by reducing maintenance cost .

V. STRATEGY OF ENERGY CONSERVATION

- Creating awareness in people.
- Making small home automation systems.
- Role of Government .
- Changing the lighting scheme.
- Efficient way of using electronic devices.
- Increase use of solar energy.
- Use public transports.
- Cogeneration.

VI. SIMPLE HOME AUTOMATION SYSTEM

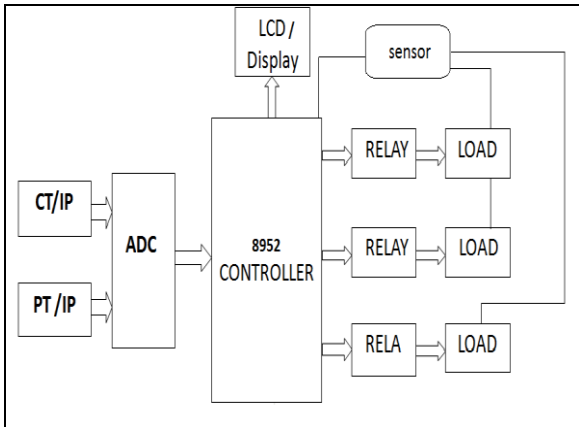


Fig 1:- Basic Block Diagram

A. 89s52 Microcontroller.

It has +5v supply requires 4096 bit program memory, two 16bit timers / counters. It is the **heart** of the system. In these, 89s52 microcontroller was used. It takes the value from sensors in the form of signals, compare it and act the relay which is connected to it So that ON-OFF load is possible. 8-Bit microcontrollers make it useful to be used for IC testing, Low power consumption, High speed perform. Bit addressing used for program control flags having 8 bit word size used for computing tasks.

B. ADC

All inputs from CT&PT are converted into digital form by using ADC. The ADC0808, ADC0809 data acquisition component is a monolithic CMOS device with an 8-bit analog-to-digital,converter,8-channel multiplexer and microprocessor compatible control logic. The 8-bit A/D converter uses successive approximation as the conversion technique. The converter features a high impedance chopper stabilized comparator, a 256R voltage divider with analog switch tree and a successive approximation register.

C. Sensors

We use thermistors to measure the temperature. It is made from a semi-conductor which is sensitive directly to the change of temperature. It has a resistant between 100-450,000 Ohm-cms. The infrared sensors is use to detect the people entering a room. Following fig shows the sender and receiver circuit of IR sensor. It consist of IR LED and IR Transistor, This Medium Range Infrared sensor offers simple, user friendly and fast Obstacle detection using infrared; it is non-contact detection. The Implementations of modulated IR

signal immune the sensor to the interferences caused by the normal light of a light bulb or the sun light.

D. Case Study

- for lighting load (fans & tubes)
- Consider, AISSMS(IOIT) COLLEGE,SECOND FLOOR

LOAD	WATT	NO.	ENERGY CONSUMED
DOUBLE TUBE LIGHT	80	6	1382400
SINGLE	40	2	230400
FAN	80	6	1382400

Table 1. fitting and energy consumption per year For room no 210

LOAD	WATT	NO.	ENERGY CONSUMED
DOUBLE TUBE LIGHT	80	9	2073600
SINGLE	40	2	230400
FAN	80	9	2073600

Table 2. fitting and energy consumption for Room no 213

- Cost /unit=Rs 7.05/-
- Total energy bill per year = Rs 51978.24 /-
- According to FEMP(Federal energy management program- family sized commercial) 30-35% energy saving with these technique.
- consider 30% = 7372.8*0.3

= 2211.84 KW *7.05

= Rs. 15593.47 /-

∴ 51978.24-15593.47 = Rs. 36384.7 /-

- Installation cost = Rs. 3000 /-
- Maintenance cost = Rs. 1000 /-
- Payback period = 4000/36384.768

=0.1099 (1 month)

Total cost saving = Rs. **32384.7 /- per years**

VII. CONCLUSIONS

Successful implementation of above simple home automation systems leads to saving of large amount of money as well as saving of energy is occur. Awareness and information of this prototype in general Public helps for not only energy conservation but supporting for role as social awareness about consumption of energy.Automation for 2 rooms through controller gives thousands of rupee saving.Energy consumption is an indicator of any country's

prosperity. Energy saving is an important issue nowadays. This paper presents the building of the simple smart system prototype using a microcontroller. The model was created for the rooms and floors in commercial Buildings. The temperature sensors are put in the rooms and infrared sensors are put at the door. The desktop & LCD shows the output of the fan speed controls and light switch. The software shows the status of the people in the rooms and temperatures.

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