

# Residence Energy Control System using IoT

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**Abstract**— To protect our earth being exhausted by the activities of human beings, it is the one of the measure to protect the earth by using the resources. Our aim is to conserve energy in home appliances. We have used several applications, here to control the energy that is being exhausted by the human. Here we have effective solution to save energy consumption from home appliances. This paper is developed on smart socket and Internet of Things to minimize the energy consumption on home appliances. This application is controlled by four application mode, They are peak time control mode, Auto control mode, user Control mode, energy limit control. The main aim is to control the energy at home appliances.

**Key words:** Internet of Things, Smart socket, Controllers

## I. INTRODUCTION

In the recent years, energy saving has been became an important aspect of electronic design of appliances. To save energy it is essential to use modern technology such as automatic lightning system, temperature control system, and regulatory system. Energy efficiency is the main aspect of all these advanced automatic systems. We can also save energy by using basics of internet of things for this technology.

A network system which connects electronic devices, sensors, software and concerned network entities together will make a network of internet of things, which will provide more services to users. Moreover this system deals with the complete savings of energy in the home appliances, as compared to the old system this system includes IoT based project the system control through internet by using a GPRS network. This saves more percentage of energy as compared to the earlier based system. As we can say in the earlier system model, the usage of internet is not adopted, wherein in the modle the usage of internet is adopted which make use of usage of on and off any where.

There are many theories and controlling methods are proposed using internet of things, developed a tablet computer based home energy management scheme to monitor the energy agency. In this system the energy saving, the energy efficiency users living convenience all are need to be balanced. Therefore, In this paper advanced energy savings scheme named as residence energy control system using IoT is proposed to reduce the energy consumption of domestic appliances.

Based on IoT Technology and wireless smart socket Technology. It manages energy consumed by individual appliance and also monitor and controls the standby power consumption of appliances. To imply the users lifestyle and automatic turn off the power of the each smart socket connected to IoT an algorithm is applied in this system, when the electric appliances are not in use. It can save upto 43% of energy.

## II. BACKGROUND

The development of Residence energy control system is mainly to save energy in the home appliances and to manage the turn on and turn off of a power sockets. So as to develop the control algorithm to reduce the energy consumption. Even it control the electric appliances when the power is overloaded.

## III. SYSTEM DESCRIPTION

In this system the data of energy consumption in the appliances is gathered by smart sockets through Internet of Things. By using an electronic algorithm the control systems which are in the standby mode are turned off automatically. This system is operated accordingly the limit provided by the consumer. The data which is used to control the state of the appliances are stored in the cloud server and also the user interface.

The user can set the limit of the smart socket and can control manually.

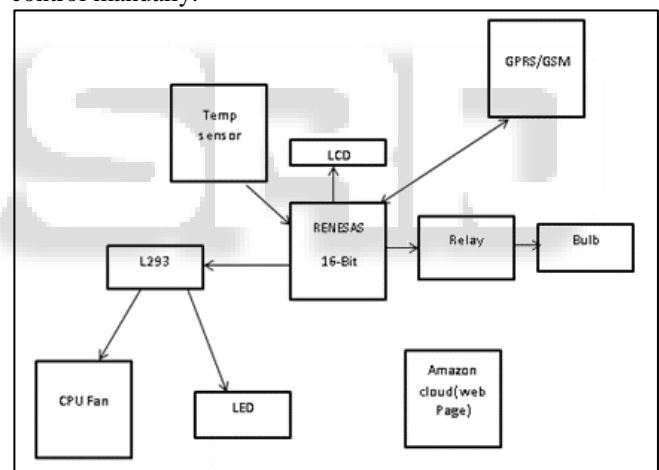


Fig. 1: Block diagram of system architecture

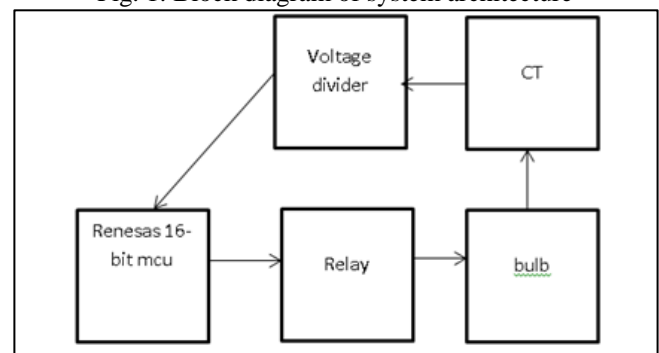


Fig. 2: Block diagram of automatic control

It consist of memory, action trigger and seven modules including a learning module, user interface module, information/command module, trans-receiver module, automatic control module, user control module, energy limit control module and peak time control module. User defined energy, output of the learning module, the energy data and

user commands all are saved in the dynamic random access memory. Old data is stored in hard disk and retrieve to dynamic random access memory. Action trigger control system is used to trigger the learning modules , transceiver module, command module and four control module for further activities. The frequency of the trigger signal to each control module is once per 10 min throughout a day.

It is a general purpose register with 8 bits, 32 register and ROM of 64 kb, RAM of 4 kb flash memory of 4kb. Its a on-chip high speed and on-chip oscillator and also has on-chip single power supply flash memory and debug functions. It has total 11 ports with 58 input and output pins.

This system module develops a connection between appliances and the internet or network to send the data to the cloud server, for the storage purpose we can make use of any server. It provides a friendly relationship between user and the appliances so as to make the operation easily.

In this Residence energy control model, the smart socket automatically measures the electricity and their data. Our main aim is to save energy through smart sockets and Internet of Things. To develop the system we make use of Temperature sensor, Renesas 16-Bit microcontroller, Relay, bulb, L293, CPU fan, Voltage divider, CT, LCD. Temperature sensor measures the atmospheric temperature and automatically on and off the gyser based on the requirement. One more main concept what we adopted here is overloading of power supply. This establish the turnoff of main switch when the electricity supply is more which leads to overload. It indicates the sound and displays a message when it is overloaded. Notification is sent to the respective, and the data has been updated to the database along with the voltage supplied, frequencies, day and timings. If the system is in AC mode, the module can on and off the power of smart socket. It is controlled through the cloud server manually. Anytime anywhere you can make use to operate the on and off for the home appliances, and the data are used to store in the database from the server side. Since it is a user friendly, you can operate to control anywhere from the server through the internet access. even it can control two appliances at a time by L293, where it can access and work on two device at a time. With all this scheme, making use of this technique we are saving more percent of energy that are been exhausted in the daily life from human.

#### IV. CONCLUSION AND FUTURE ENHANCEMENT

Today we find many appliances which is used to control or minimize the energy, but it's a new concept which can save more energy from the home appliances. The main purpose of establishing this system is to control the electricity and the energy of home appliances by automatic control. Where it can save up to 43.4 % of energy in day to day life by human. A simple Internet of Things construct the connection between smart socket and the server which can operate through the internet. It uses neural network algorithm which mainly save unnecessary energy that are being wasted from the home appliances

In future we can enhance the security, encapsulation of data, reliability, security is mainly to safe guard the system. And encryption is mainly to secure the data from the hackers by making turn on/off instead of off/on. Not only this, if we go through more on this this we can try to save more energy and the electricity can compare to this system of design. This

can be enhanced in the future to establish the energy saving concept in more percentage, compared with this experimental results.

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