ENERGY MANAGEMENT FOR LAB

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ABSTRACT

Energy plays a key role in achieving the desired economic growth. The entire fabric of developmental goals is webbed around a successful energy strategy. Energy is a pivotal prerequisite of developed economy and social structures. One of the major problems concerning its supply is the depleting nature of the extraction of resources, combined with the need for transition to renewable energy supplies. The last depends on a number of scientific and technological break through. Meanwhile, energy conservation promises to all the gap between supply and demand. Several measures for conservation of energy are very important for consideration. The conservation of energy, therefore, is using less more wisely than before. Saving a watt is nearly always cheaper than increasing the supply by a watt. The energy industry is one of the most capital intensive. Efficient utilization of energy resource is not only conservation it also saves capital investment. Thus conservation is really the cheapest of energy resources at least until its potential is exhausted. In this paper importance of energy management and its benefits are discussed. Use of energy efficient equipment to save energy is proposed.

Keyword: *- Automation, IR Sensors, Person Counter, Utilization.*

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1. INTRODUCTION

Home/once automation is the control of any or all electrical devices in our home or once, whether we are there or away. Home/once automation is one of the most exciting developments in technology for the home that has come along in decades. There are hundreds of products available today that allow us control over the devices automatically, either by remote control; or even by voice command. A home automation system integrates electrical devices in a house with each other. The techniques employed in home automation include those in building automation as well as the control of domestic activities, such as home entertainment systems, houseplant and yard watering, pet feeding, changing the ambiance "scenes" for different events (such as dinners or parties), and the use of domestic robots. Devices may be connected through a computer network to allow control by a personal computer, and may allow remote access from the internet. Energy crisis is the main problem that we are facing nowadays. So the conservation of energy is relevant in this occasion. The objective of this project is to overcome this problem. This project has 2 parts. First is Person counter and the other one is Automatic room light and temperature controller with a temperature and light intensity display .In today's world, there is a continuous need for automatic appliances. With the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life. The temperature and light intensity in the room is sensed and with respective to that, light and fan in the room is switched ON/OFF when a person enters/leaves the room. The circuit consists of IR transmitter and receiver LEDs which are used to sense the entering or leaving of a person to or from the room. The temperature sensor measures the temperature inside the room and the analog signal from the sensor is processed by the microcontroller. Likewise the Light dependant resistor (LDR) generates the analog signal proportional to the available light inside the room. This signal is also processed by the microcontroller. The speed of the fan and brightness of the light is controlled accordingly. Whenever the person leaves the room, light and fan will be switched OFF.

1.1 GOAL OF THE PROJECT

The primary Goal of this project is create the circuit which we have designed is simple and compact. With the help of some software tools, we were able to develop the required coding and burn it to the Integrated circuit. This Project is PIC based room automation is a reliable circuit that takes over the task of controlling the room lights as

well us counting number of persons/visitors in the room very accurately. When somebody enters into the room then the counter is incremented by one and the light in the room will be switched ON and when any one leaves the room then the counter is decremented by one. The same is done with the fan also. The light will be only switched OFF until all the persons in the room go out. The total number of persons inside the room is also displayed on the LCD displays.

1.2 SCOPE

Thus from the goal of project, scope can be described as detailed study utilization of energy and automation. Energy is an essential basic need for not only human beings, but also for national economics and social development. However, production of energy is found to exhibit local and global environmental impact, if not appropriate technology and management..
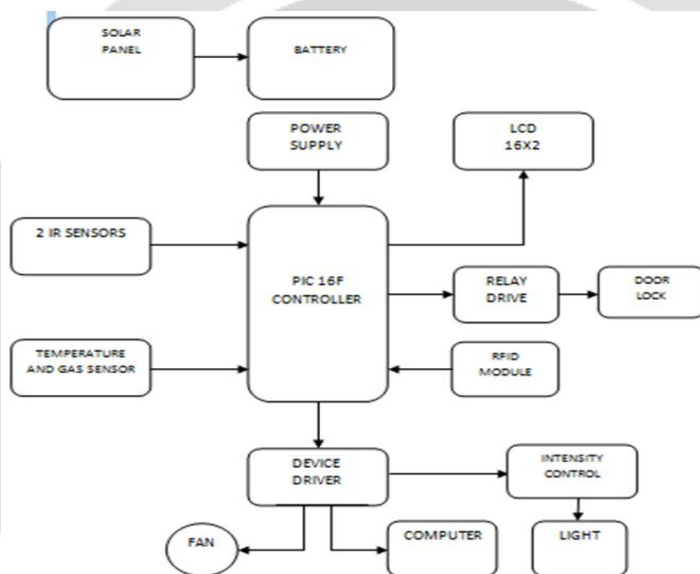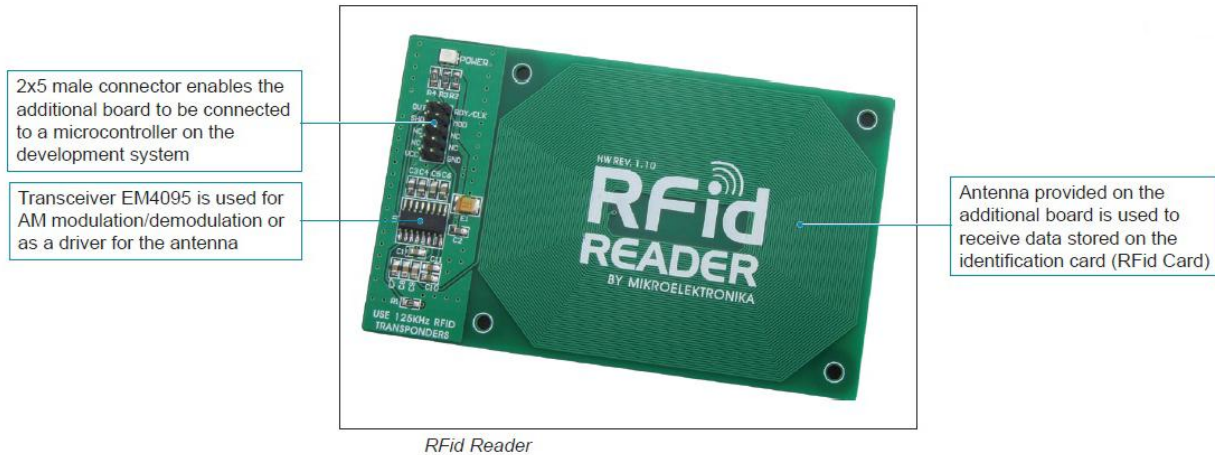
2. BLOCK DIAGRAM

Fig -1: block diagram

This project is to be used in college labs so as to save energy and provide automation. If sensors are used as inputs to circuit at the door to count the number of persons in the room. These sensors will check the persons coming in and out of the hall. These if sensors are connected to the PIC controller. The controller counts the in persons and out persons. LCD is used to display the number of persons in the hall. A device driver is used to control the light and pc supply. A gas sensor is used to detect and alarm. Smart card is used for door opening means here we used RFID module.Door will closed automatically when lab is vacant. The operation of the RFID reader board is based on amplitude modulation of radio waves and electromagnetic induction. The RFID card is not provided with the RFID reader, but you can buy it separately. Used in this experiment is the LM35 temperature sensor.LM35 IC is used as the temperature sensor. It consists of three pins. For every1 degree variation in the room temperature, there will be a variation of 10 mV in the output voltage of this IC. This analog signal output will be given to the microcontroller for further processing and controlling. The room temperature will be displayed in the LCD. A liquid crystal display or LCD draws its definition from its name itself. It is combination of two states of matter, the solid and the liquid.

2.1 RFID MODULE

2x5 male connector enables the additional board to be connected to a microcontroller on the development system

Transceiver EM4095 is used for AM modulation/demodulation or as a driver for the antenna

Antenna provided on the additional board is used to receive data stored on the identification card (RFid Card)

RFid Reader

The RFID reader additional board is used to read identification cards (RFID card) using radio waves. This additional board feature , receiver, transmitter module with antenna and a 2*5 male connector that enable connection with development systems. The operation of the RFID reader board is based on amplitude modulation of radio waves and electromagnetic induction. The RFID card is not provided with the RFID reader, but you can buy it separately.

3. RESULT

The partial result is that using RFID known person can enter in lab and unknown person are rejected. All the system working on PIC controller. By using IR sensor it sense how many person are enter in lab and will be display on LCD. Using limit switch PC on/off is done. The temprature sensor automatically operates on human body temprature and it control light, fan. Total energy provided by solar to the system. We got the purpose of project that is "energy saving for lab".

3.1 APPLICATIONS

- It is used for collage lab.
- Used in industries and office.
- Energy saving in automation.

3.2 Future Scope

- Module we can add camera to the system.
- We can add RFID also.

4. CONCLUSIONS

This system is mainly used for saving energy in office, laboratory and industries.IR sensors use for count person in lab.Device driver used for control intensity of light pc.Door will open with smart card and whole system is power using solar panel and battery.Studies on energy consumption have shown that it is at a stage of retardation by the involvement of government and due to advance technological growth. Such a mechanism to improve not only energy consumption but also a comfortable living can be achieved by room automation technique. Since the technologies are growing day by day there will be more advanced automation techniques which can improve current life style and can save more energy will capture our market. by doing this project we came to the conclusion that even though we have developed a small part of automation in a single room, it can be extended using more components such that it could be installed in bigger rooms. By using the internet services more development can be done.

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