ENERGY CONSERVATION USING MOMENT DETECTION

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ABSTRACT

This is about acquiring different reading from various sensor and turn on and off the appliances depending on set point. in this project we uses passive infrared sensor by using this sensor it detect human interface and sense human or motion. If no one is present in room then it will turn off the appliances. Information store in pc by using visual basic software by using this concept we can save electricity and bills of electricity. If any fault in the system is occur then it will send an automatic message to maintenance department. We can check reading in visual basic at any time and any day. This project uses the Passive Sensor (PIR sensor) to detect Infrared the body Heat and the movements of humans. Hardware takes the signal from PIR sensor. The Hardware of this project is ARM and max232 communication module to Interface with Visual Basic (VB). When ARM get signal from the sensor, so lighting System and fan turn OFF automatically after a delay time off 2 Minutes. Within 2 minutes time frames, if the sensor detects human movement or Heat in the area, control system will reset its program not turn OFF the lighting System or air-conditioner system.

Keyword:- *GSM(Global system for mobile communication), Energy Meter, PIR(Passive Infrared) Sensor ,LM35, LDR(Light Dependent Register).*

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1. Introduction

In this project we are using various sensors. However, the basic signal processing of the system takes different limits. Which are temperature, LDR, and fume sensor. For measuring various limits values, various sensors are used and the output of these sensors are converted to control the values. The control circuit is designed using micro-controller. The outputs of all the three characteristics are fed to micro-controller. The output of the micro-controller is use to drive the LCD display, so that the value of every parameter can display. In addition to the LCD display micro-controller outputs use to drive a relay independently. This relay energizes and de-energizes automatically according to condition the parameter. Nowadays, electricity is the one of the important energy in human life. The wastage Of electricity in this world is increase because we do not have the consciousness of the Importance of electricity. The reason of increasing expense of managing, conserving and distributing. This problem also occurs in all university in Malaysia. level of electricity use is high especially at the lecture halls. Students do not aware that How important for them to cut the cost of electricity. Thus, this energy-saving project will create. From the earlier case study, at the end of the lecture session, the Light system and air-conditioner are kept on and unattended. Sometimes lecturers or Students to forget switch off the light and air-conditioner. This will increase the waste of electricity. This project will use the Passive Infrared Sensor (PIR sensor) detect heat of human body. These projects also use Visual Basic V.6 to deal with the hardware. When the sensor detects no one in the lecture hall, so the microcontroller will check 2 minutes. If within time students coming into the lecture hall, the fan and light system will reset its planned but if the hall stays empty the light system and fan will turn off automatically. Besides that, other features of this system is pre-determine timer. These predestine times can changed at Visual

Basic VB (6.0) software is developed for setting of the control system . Light system and fan will turn off automatically

2. Literature Survey

A literature study has been carried out which include a broad overview of available condition monitoring technique. Next to this list of condition monitoring system technique and methods of data processing, the literature study also contain possible application such as energy saving. Control systems that aim to improve the efficient utilization of electrical energy for lighting purpose and are available in the market. The literature study also includes a chapter covering the economic aspects of condition monitoring systems. However data are very limited, depending on the design and also changing rapidly due to development of specific system.

These chapters describe the methodology used for the design of the hardware and software part. It begins by giving and overview of energy safe keeping and then describes how the insistent hardware and the software for the system were design. We are designing a micro controller control light energy and temperature through the control system. where human movement was to be under continuous surveillance. To achieve this sensor that produce digital output where employed.

In this research, two types of sensors namely, PIR motion sensors and LDR were used. These sensors were connected directly to the microcontroller pins and acted as the inputs to the system. For notification purposes, a 2x16 LCD was employed to indicate temperature and light intensity.

The receiver outputs are interfaced with the PIC16F690 which under the control program stored in its memory displays the room occupancy on the LCD and makes decision on when to switch on/off the lights through a relay.

For this work subsist meter reading technique in India reanalyzed and conducted an extensive study on many energy measuring instruments available in the market. In subsist system either an electronic energy meter or an electro-mechanical meter is fixed in the premise for measuring the use. The meters currently in use are only capable of recording kWh units. The KWh units use then it   record by meter reader monthly, on foot. The recorded data need to be processed by ammeter reading company. For processing the meter reading, Company needs to kept record data to an account holder and then determine the amount

Owed by means of the specific tariff in use.

- Identity Module

- Built in Network Status LED

- Temperature Range : - 19°Celsius to +53 °Celsius

- Input Voltage to: DC 12 V 5 V

- LDB 9 connector (Serial Port) provided

3. Proposed System

To acquire different reading from various sensor and turn on and off the appliances depending on set point. In this project we uses passive infrared sensor by using this sensor it detect human interface and sense human or motion. If no one is present in room then it will turn off the appliances. Information is stored in pc by using VB software by using this concept we can save electricity and also bills of electricity. If any fault in the system is occur then it will send automatic message to maintenance department.
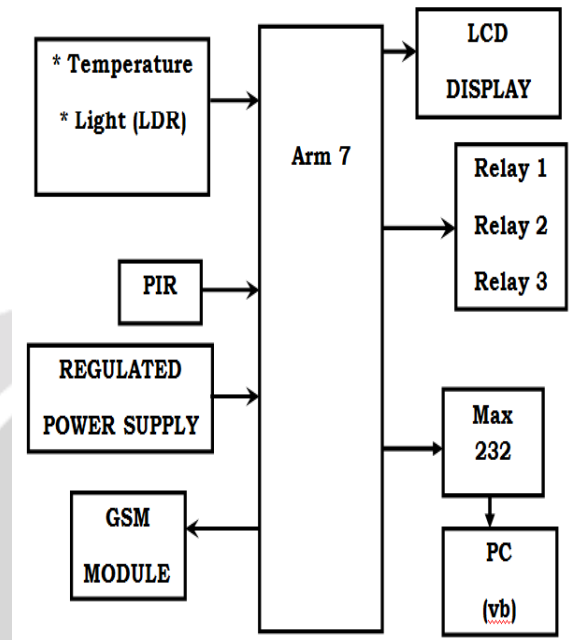
4. Hardware Architecture

Fig. 1 Block Diagram Automatic Energy Saving

4.1 Hardware Architecture Description
1. ARM-7:

The LPC2148 microcontroller is based on a 32-bit ARM7TDMI-SCPU with real-time emulation and embedded trace support, that combine the microcontroller with embedded high-speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty.

Due to their tiny size and low power consumption, LPC2148 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale

2. PIR SENSOR: -

A PIR(Passive Infrared) Sensor is an electronic sensor that measure infrared(IR) light radiating from object in its field of view. All objects with a temp above absolute zero emit heat energy in the form of radiation. This radiation is invisible to human eye but it detect by PIR sensor. PIR don't detect or measure the heat. It detects the IR rays emitted or reflected from an object.

3. Energy Meter:-

An energy meter is a device that measure the amount of electric enegy consumed by a residence, business or an electrically power device. The energy meter is connected to the system it count the unit and indicate the how much amount of may measure demand, the maximum use of power in some interval. The meatering allows electric rates to be changed during a day, to record usages peak high cost period and off peak, lower cost, period.

4. LM35:-

The LM 35 is temperature sensor whose output voltage is linearly proportional to Celsius(centigrade) temperature. It has an advantage over linear temperature sensor calibrated in kelvin. Temperature is the most measure process variable in industrial automation. Most commonly a temperature sensor is used to convert temperature value to an electrical value to an electrical value. Temperature in industrial sensor are the key to read temperature correctly and to control temperature in industrial application. The LM35 are precision integrated circuit temperature sensor, whose output voltage is linearly propotional to Fahrenheit temperature. LM35 those not required any external calibration or trimming to provide typically accuracy of + or -1/4 degree Celsius at room temperature and + or – ¾ degree Celsius over full -55 – +150 degree Celsius.

5. GSM MODEM:

GSM (Global System for Mobile communication) could be a digital mobile telecom system. With the assistance of GSM module interfaced, we will send short text messages to the specified authorities as per the applying. GSM module is provided by sim uses the mobile service supplier and send sms to the several authorities as per programmed. This technology change the systema wireless system with no specific varies limits.

GSM uses a variation of your time division multiple access (TDMA) and is that the most generally used of the 3 digital wireless telecom technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses knowledge, then sends it down a channel with 2 alternative streams of user knowledge, every in its own slot. It operates at either the 900 megacycle per second or 1800 megacycle per second waveband.

5. Software Architecture

For the designing of the system VB is the important software VB is design to help for operating the system in easiest way for this application the programmer have easy to create a complex application programmer write a simple programmer without writing complex and much code the VB compiler share the other languages like C or C++. In the VB we are able to solved Boolean expression logical and bitwise operation. In VB five to six compiler are used to compile the code it is control the many system without any error.

5.1 Algorithm:

- START
- Energy meter calculate the reading as PIR, LDR, LM35.
- Initialization all the sensor such as the SMS to through GSM.
- If the fault is occurs then the SMS to through GSM.
- PIR sensor sense the motion in the area if motion is occur then turn ON the application.
- LDR and LM35 sense the temperature and light intensity and according to the application get turn ON or OFF.
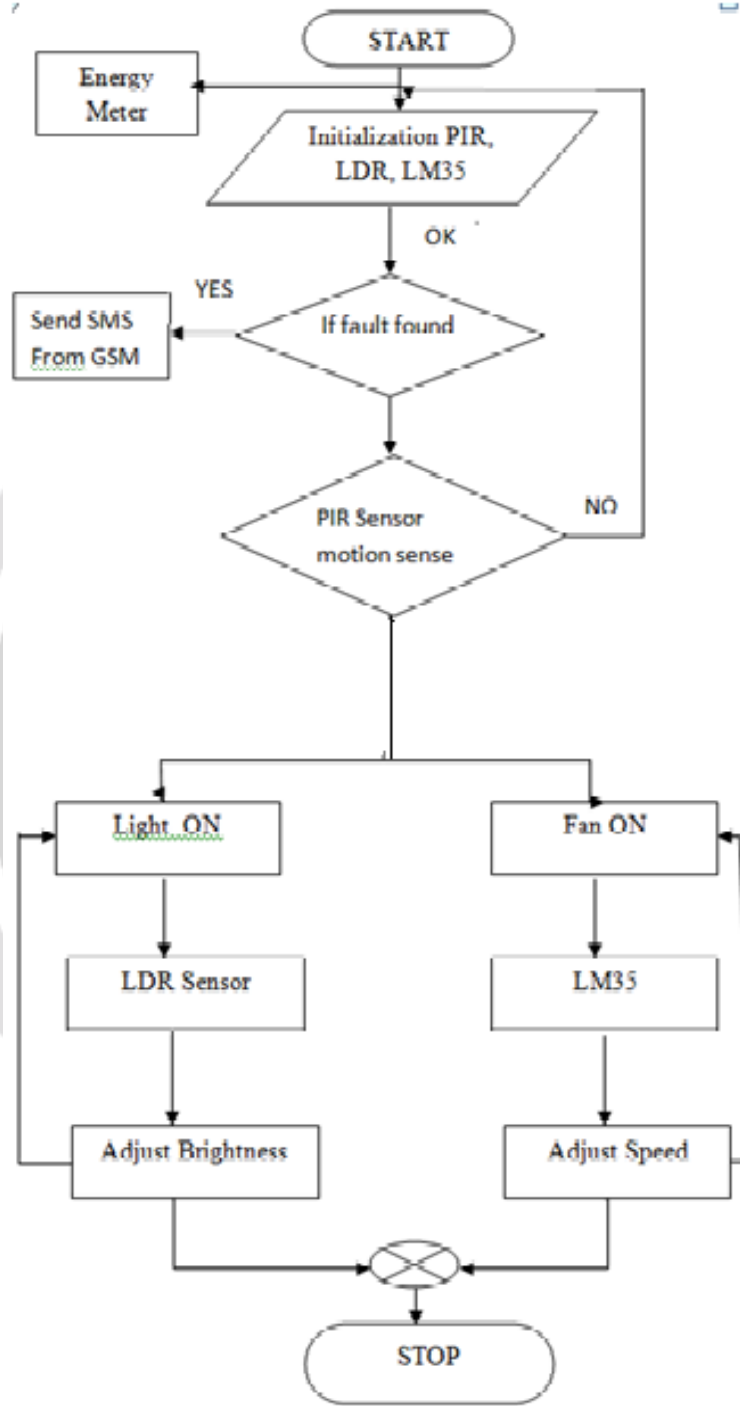
5.2 Flow Chart

Fig. 2 Flow Chart

6. Result

Depending on the human motion PIR sensor gives command to the microprocessor and it will operate the LM35 and LDR depending on light intensity and temperature. Energy meter count the reading which are use in the system and send through max232 to the pc in the VB reading are stored in the excel. So we can check report Hourly, Daily, Weekly, Monthly, Yearly.
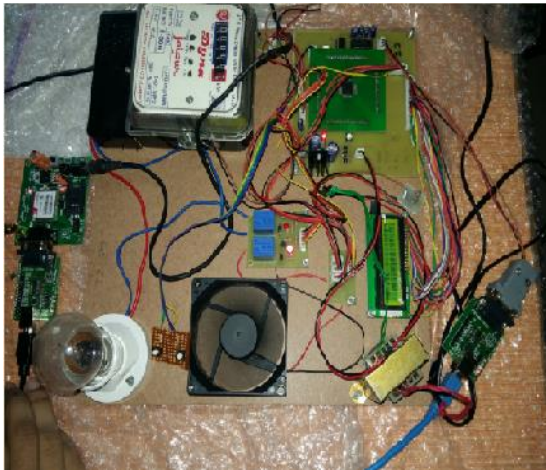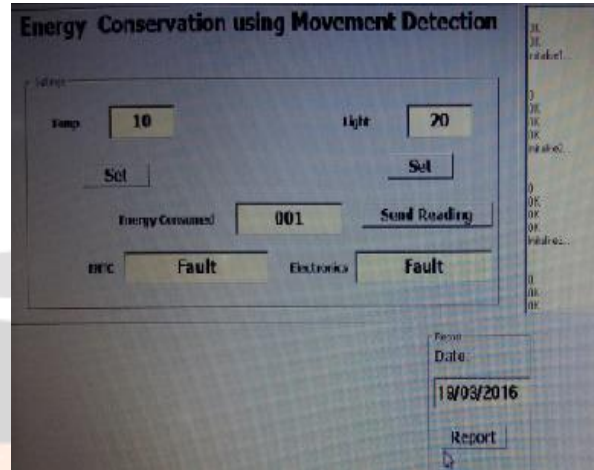

Fig. 3 Operation of system

Fig. 4 Window of VB Software

Fig 5 Excel Sheet of Calculation of Energy

Fig 6 MSG through GSM on Mobile

7. Conclusion

By using this paper we can save the electricity and also reduce the bills of electricity. So in this way we can save the large amount of electricity. The programming and interfacing of ARM 7 has master during the implementation. This work include the study of energy saving system in many applications.

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