A Review on Design & Development of wireless Smart Power Saving System for Home Automation using AVR Microcontroller.

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ABSTRACT- Automation is the process which is executed without human interaction or with less human interaction. Automation is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat treating ovens, switching in telephone human networks, aircraft and other applications with minimal or reduced intervention. This paper aims to design and develop home automation using AVR microcontroller In this system AT mega 16 microcontroller is used. In our system also used GLCD, Touch screen, LCD, zigbee Technology. It also presents the design and implementation of an intelligent home security system with a modular self reconfigurable robot as the surveillance. This paper aims at atomizing any home appliances. The appliances are to be controlled automatically by the AVR Controller.
As a result, the system has become low cost Automation and power saving as well as an approach to minimization of human work. The main objectives of our system is to enabling the Intelligent and low-cost automation of home are crucial in order to improve process efficiencies, deliver quality products, and ensure timeliness and accuracy of systems.
Keywords- AVR microcontroller, Zigbee, GLCD, LED, Relay.

I. INTRODUCTION

Wireless communication medium implementing for design and develop an efficient digitally controlled smart home. Home automation is one of the most marvellous advancement of technology. It represents the idea of smart home which means the controlling of home appliances in an integrated system. The biggest benefit of automation is that it saves

Labour, however, it is also used to save energy and materials and to improve quality, simplest Accuracy and precision. For saving the power here we introducing the technology which is based on motion or activities of the number of person present in home. Power saving mode is totally dependent on the motion detection or activities of the person inside the home. Automation is the type of control is on off control. AVR microcontroller is an appropriate addition to this technology having a quite advantages over 8051 microcontroller. The AVR is an 8-bit RISC single chip microcontroller which includes Harvard architecture that has some special features such as on-chip program (code) ROM, data RAM, data EEPROM, timers and I/O port. . ZigBee is very low cost, low power consumption, two ways, wireless communication protocol. ZigBee protocols are intended for use in embedded applications requiring low data rates and low power consumption. In our system 4-wire resistive touch screen is used.

II. LITERATURE REVIEW

In 2015, Archana N. Shewale, Jyoti P. Bari Proposed system, describes the methodology of renewable energy based home automation in which two things are consider one is energy consumption and another is energy generation. In

this, ZigBee is used for monitoring energy consumption of home equipments and power line communication (PLC) is used to monitoring energy generation.

In 2015, S .Anusha, M.Madhavi, R.Hemalatha In this paper, we describe the design and development of a remote household appliance control system using ATmega328 microcontroller and android mobile through GSM technology.

In 2014, Madhu M S, Gangadhar M, Sanjaya G C proposed a system. Here locking and unlocking of the door is done by using finger print sensor and GSM modem. Initially consider the complete system is in disable state. If user wants to enter the house, then the user suppose to verify his finger print pattern with pre stored pattern in its own flash memory. If the verification is invalid then it displays unauthorized access. Otherwise it unlocks the door and enables the power saving module by turning the power supply ON.

In 2014, Manish Kumar, Ramandeep Singh proposed a given embedded system is used for controlling home appliance using your pc and Zigbee. All appliances are connected with microcontroller or through relay. The command is send through hyper terminal or X-CTU software. In this embedded system there are two part, one is transmitter and one is receiver. The transmitter contains Zigbee transmitter and RS232 circuit and receiver contains Zigbee receiver and ATMEGA128 which is connected with relay and appliance i.e. fan, bulb, motor etc.

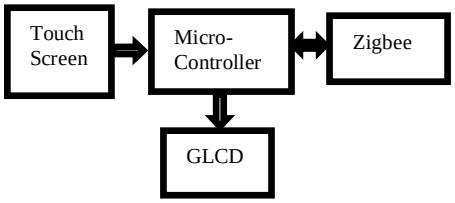
In 2014, Mohammad Arif Hossain, Md. Nazmul 6Hasan he system, here, has been designed configuring temperature, light, fire and IR sensors. The system using a power supply unit has also solar power supply unit as back-up in case of failure of main power. So, the system will be kept active always. The system has a LCD display which gives the information about temperature, number of persons, fire situation etc.

In 2014, Vijay S. Deshpande , Amit S. Vibhute, Amol K.Choure, Prof. Smitha P This proposed system aims at atomizing any home appliances. The appliances are to be controlled automatically by the programmable Logic Controller (PLC) DELTA Electronics DVP SX10. As the functioning of the Appliances is integrated with the working of PLC, the project proves to be accurate, reliable and more efficient than the existing controllers.
In 2012, Ahmed ElShafee, Karim Alaa Hamed This paper presents a design and prototype implementation of new home automation system implementation of new home automation system that uses Wi-Fi technology as a network infrastructure connecting its parts. The proposed system consists of two main components; the first part is the server (web server), which presents system core that manages, controls, and monitors users' home. Users and system administrator can locally (LAN) or remotely (internet) manage and control system code. Second part is hardware

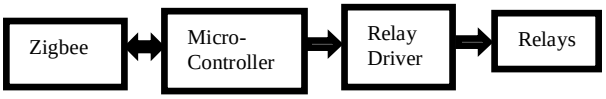
III. PROPOSED WORK

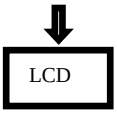
The given system is used for controlling home appliance using your AT mega 16 microcontroller and Zigbee. All appliances are connected with µc and through relay. In this system there are two part one is transmitter and another is receiver. In transmitter send he signal through microcontroller through Zigbee module. At the real time it shows the status of each and every appliance. Another side of system the receiver, the receiver is interfaced with all appliances through which the system receives the signal wirelessly from zigbee receiver through microcontroller and activates the appliance to be ON.

TRANSMITTER END :-



RECEIVER END :-





A. Microcontroller AtMega16

AT mega 16 Microcontroller is a High-performance, Low-power AVR 8-bit Microcontroller. The features are Power-on Reset and Programmable Brown-out Detection, Internal Calibrated RC Oscillator, External and Internal Interrupt Sources Six Sleep Modes: Idle, ADC Noise Reduction, Power-save, Power-down, Standby and Extended Standby. By executing powerful instructions in a single clock cycle, the ATmega16 achieves throughputs approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed.

B. Zigbee Transceiver Modules

In this system Zigbee is used because Zigbee is Reliable, Supports large number of nodes, Easy to deploy, Very long battery life , Secure Low cost Can be used globally. Zigbee is a new Wireless sensor network technology characteristic of less distance and low speed. It is a new wireless technology that has application in various fields. The main features of this standard are network flexibility, low cost, very low power consumption, and low data rate in an adhoc self-organizing network among inexpensive fixed, portable and moving devices. ZigBee is very low cost, low power consumption, two ways, wireless communication protocol.

C. TOUCH SCREEN

A touch screen is any monitor, based either on LCD (Liquid Crystal Display) or CRT (Cathode Ray Tube) technology that accepts direct onscreen input. There are 4-wire, 5-wire, 7-wire, or 8- wire resistive touch screens. In our system resistive 4-wire touch screen is used.

D. 16x2 LCD display

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

E. GLCD

This is an extensive modification of the ks0108 library that has higher performance, more features, supports more Arduino boards and is easier to integrate with different panels. The configuration mechanism has been changed to facilitate use with a broad range of GLCD chips and AT mega controllers.

F. RELAY

A relay is an electrically operated. Switch many relays use an electromagnet to operate a switching mechanism mechanically, but other operating is used. Relays are used where it is necessary to control a circuit by a low power signal, or several circuit must be controlled by one signal.

IV. FUTURE WORK

The Expected outcome of the implemented system is having effective low cost and furthers more things to add on it. The future work is more advance with wireless technology like Wi-Fi which is more advance than zigbee. These wireless networking technologies are being integrated to enable a truly Smart Grid solution for more efficient energy management while enhancing

comfort, convenience and security at the same time.

V. CONCLUSION

It is often said that the cleanest source of energy is the energy not generated in the first place. That's why conservation is touted as a cornerstone of the nation's future energy program. Home Automation Net will be instrumental in the success of Smart Grid initiatives to meet these energy conservation and demand response challenges. ZigBee wireless technology is a critical element of these communication systems, providing the robustness and reliability, low cost, security and ease-of-deployment required to make it all work together and deliver tangible benefits.

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