A Review on Home Automation System (HAS)

Renuka P. Dhage[1], S.P.Kharde[2]

M.E. Student, Dept. of E&TC, Shreeyash College of Engg. & Tech, Dr. BAMU University, Aurangabad (MS), India[1]

Lecturer, Dept. of E&TC, Shreeyash College of Engg. & Tech, Dr. BAMU University, Aurangabad (MS), India[2]

ABSTRACT: In the 21st century need of controlling electrical appliance and instrument remotely from anywhere such as an air conditioner, refrigerators, computer system, Television, security system, set top box, light or fan and so on. Different systems or technologies are used to control electrical appliance like SMS (short message service), FPGA CONTROLLER, *ARM,* AVR, GSM module, ZIGBEE etc. This paper provides an overview on home automation systems which are developed in the recent year and also provides system description and different methods used.

KEYWORDS: Electrical Appliance, Security System, SMS, FPGA Controller.

I. INTRODUCTION

In the recent years Home automation is essential requirement of house owner or households to keep home safe. Hence Home Automation System (HAS) is the researchers and companies interest area and tries to implement a system and make some gradates that keep your home safe from intruders. HAS provides the capability to control the home electrical appliance as well as monitor various household activities. A home automation system (HAS) improves the lifestyle of the control of the home devices and is provides ease, convenience, and comfort to the user and hence required degrees of intelligence and complexity. Using HAS technology house owner or user can control other appliances like lighting system, dimming, electrical appliances and many more.

II. LITERATURE SURVEY

Sougata Das et.al [1], describes the design and development Home Automation System in which a system for household appliance control using cell phone through global system for mobile communication (GSM) technology. This system allows the user or home owner to monitor and control the home appliances via mobile phone set by sending commands in the form of SMS (short message service) messages and the system also provides current status of the home appliances. The proposed system makes use of wireless control hence can be effectively used in systems were unwired connections are desired. Fig. 1 shows block diagram of system.
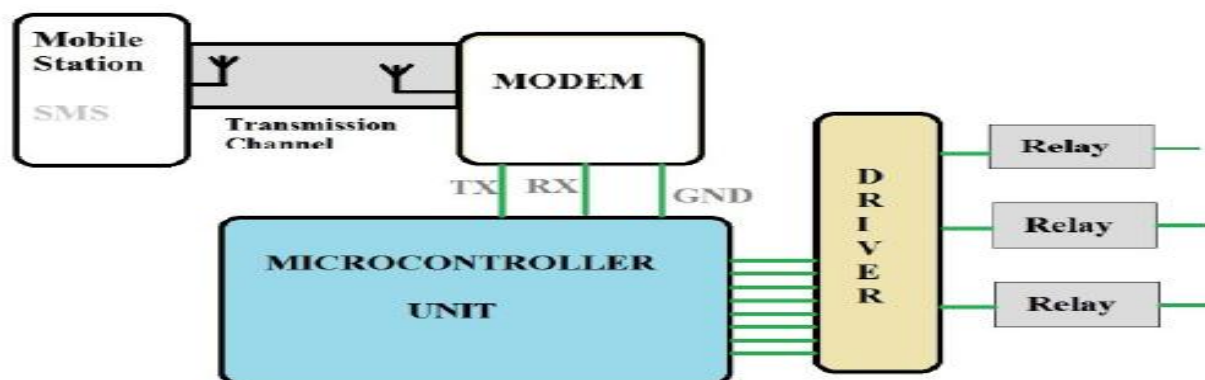

Fig. 1 Block diagram of the system [1].

Working principle of system is user send text message through the GSM network. GSM received the message send it to the ATMEGA8 Microcontroller via serial port using internal UART [5] Module of ATMEGA8. Microcontroller keeps polling to check if the modem has received any text message and sends command to modem to transmit the text message if received after that GSM modem and ATMEGA8 communicates through a special command set known as "AT COMMAND SET". Microcontroller decodes action required corresponding to the SMS command by a search and match technique where a look up table is created with set of command and corresponding actions.

Sweatha K N, Poornima M, and Vinutha M H [2], presents a novel technology where the user controls the home devices through mobiles phones. System contains the Field Programmable Gate Array (FPGA) as a controller to which the devices are directly interfaced and control to the devices is communicated to the FPGA from the mobile phone using speech recognition technique. Fig. 2 shows block diagram of the proposed system.
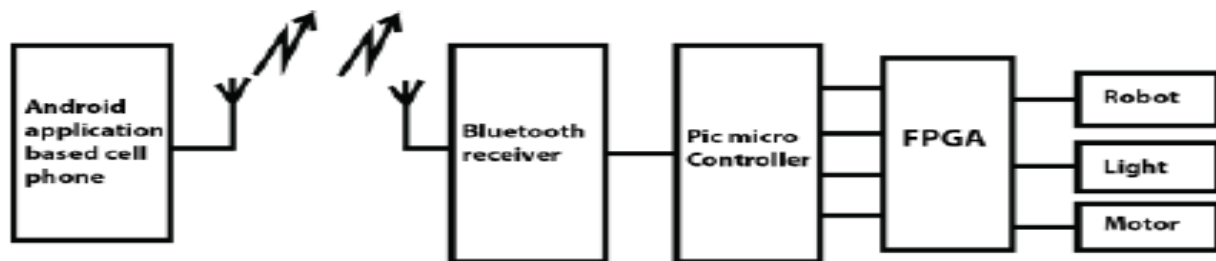

Fig. 2 Block Diagram of proposed system [2].

Proposed system contained four blocks; first one is Bluetooth Interface which is interface between the phone and the PIC microcontroller. Second block is Mobile Device, which is used for speech recognition and must contain Bluetooth module. Third block is the PIC Microcontroller, which is used to receive the data from the Bluetooth receiver serially and last block is control and monitoring devices block, which is attached to the FPGA depend on the number of free input/output ports available on the FPGA. Actual working of the system is, The android mobile is used for speech recognition. Here speech is converted to the text and transmitted to the Bluetooth module using the Bluetooth technology. Bluetooth module receives the signal and transmits it to the PIC-microcontroller using the UART. The data received is converted to digital form using the PIC-Microcontroller and the data is transmitted parallel to the FPGA controller. The devices are directly connected to the FPGA Controller and are controlled according to the data.

Vijay P. Jadhao [3], present the ARM based automation system that can monitor and control home appliances and able to establish successful communication with unknown outdoor person or visitor. This system not only provides Smart Home automation as well as it provides smart communication system which provides communication with unknown visitors visiting home. In the first phase i.e. Smart Home automation system phase commands received from user cell phone and present sensor conditions, microcontroller system send signal through its ports to switch ON/OFF appliances like light, fan, siren etc was done. But in the second phase presents incorporated features to establish successful communication with unknown visitors visiting home. In this phase doorbell switch acts as a mediator that is when no one at home, after some prespecified delay, call will be established with user through cell phone this new feature provides a user opportunity to establish communication and avoid any losses or event due to no contact at all. ARM LPC-2148 Microcontroller and cell phone can make possible Smart home automation.

Bulbul Bhaskar and R. Swarnalatha [4], presents smart home automation system using AVR microcontroller. This system incorporates with sensors, microcontroller and Bluetooth module to provide automation capability to various household activities. An AVR microcontroller offers high performance and flexibility for controlling various appliances. This system can monitor the changes in temperature, lighting, detect fire and keep a check on the safety of the house.

Manish Kumar and Ramandeep Singh [5], presents home appliance controlling using ZIGBEE, where control of home appliances, like refrigerator, fan, and air conditioner etc, was done wirelessly using computer and ZIGBEE wireless

communication protocol. Home appliance control by sending command through the computer. Fig. 3 shows Block diagram of Zigbee based home appliance controller.
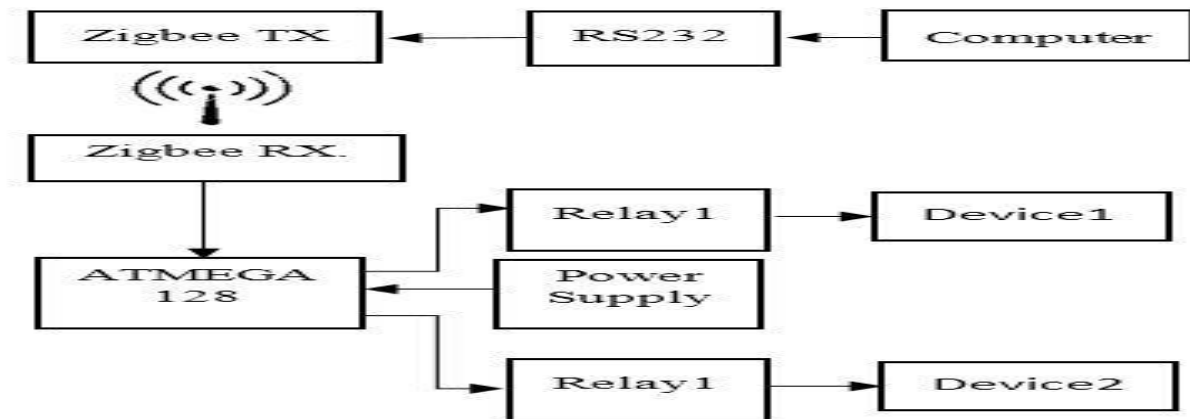

Fig. 3 Block diagram of Zigbee based home appliance controller [6].

System is used for controlling home appliance like refrigerator, fan, and air conditioner etc using your pc and Zigbee. In the proposed system all appliance are connected with microcontroller through relay and the command is send through hyper terminal or X-CTU software. In this embedded system the transmitter contains Zigbee transmitter and RS232 circuit and receiver contains Zigbee receiver and ATMEGA128 which is connected with relay and appliance.

III. CONCLUSION

Now a day applications of Home Automation System (HAS) is the new era of the advanced home system and can be monitor or operate remotely from anywhere. This paper provides the system architecture of HAS, gives details about the system, and Literature Survey provides the different remote based existing system.

REFERENCES

[1]   Sougata Das, Nilava Debabhuti, Rishabh Das, Sayantan Dutta and Apurba Ghosh, "Embedded System for Home Automation Using SMS" IEEE International Conference on Automation, Control, Energy and Systems (ACES), pp. 1-6, Feb 2014.
[2]   Sweatha K N, Poornima M, and Vinutha M H, "ADVANCE HOME AUTOMATION USING FPGA CONTROLLER", International Journal of Advanced Research in Computer and Communication Engineering Vol. 2, Issue 7, pp. 2680-2682, July 2013.
[3]   Vijay P. Jadhao, "ARM based Smart Home Automation", International Journal of Science and Engineering, Volume 1, PP-53-56, 2013.
[4]   Bulbul Bhaskar and R. Swarnalatha, "SMART HOME AUTOMATION SYSTEM USING AVR MICROCONTROLLER", International Journal of Advanced Technology in Engineering and Science, Volume No.03, Issue No. 02, pp. 234-342, February 2015.
[5]   Manish Kumar and Ramandeep Singh, "HOME APPLIANCE CONTROLLING USING ZIGBEE ON ATMEGA128 HARDWARE PLATFORM", International Journal of Research in Engineering and Technology, Volume: 03 Issue: 07, pp. 469-472, Jul-2014.