Smart Switch to Connect and Disconnect Electrical Devices At Home Using Internet

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Abstract:_This paper presents the development of a firmwarefor a Smart Switch, which can control the on-off of any electricaldevice at home by using internet. The Smart Switch is connectedto internet via Wi-Fi, through a computer, smartphone, tabletor any device with internet access. In order to perform thisconnection it is necessary to write the IP pre-programmed intothe Smart Switch in a web browser (Internet Explorer, Chrome,Firefox, etc.) with the purpose to load the Smart Switch server,which will open a configuration page to write the data of theuser's network. Then, the user will select in automatic mode thenetwork, the security type, and the user must have written apassphrase. Once these information is uploaded and saved, it isnecessary to restart the Smart Switch in order to get access tointernet, from which the user can control the Smart Switchsimply sending a number one or a number zero to switch theelectrical device, this process is done in principle via the internet,but it can be done without the use of internet, i.e. by using a localnetwork._

KEYWORDS: _Microcontroller, Smart home, Devices._

INTRODUCTION

The rapidly advancing mobile communication technology and the decrease in costs make it Possible to incorporate mobile technology into home automation systems. In olden days we were not monitoring the Office and Home appliances by sitting at one place. We had controlled those appliances manually; it takes more time to for controlling. This is disadvantage here like time consuming.

We can overcome the disadvantage of the existing method by Remote control via the Internet and it's a new feature and used in home automation systems. However, providing a

mechanism for interaction between devices in this environment is quite challenging. The internet has been mostly used to connect personal computers so far, but shortly all kinds of appliances with embedded computers will exchange information over the Internet. A massive no of microcontrollers are available in today's devices which can be linked to the Internet. If these intelligent appliances could be connected to the Internet at low cost, the way we control and manage their functions would change entirely.

The embedded systemrequires a network interface such as Ethernet, a TCP/IP protocol stack, embedded web server software and static and dynamic web pages that form the user interface for that specific device. The system uses a compact circuitry built around LPC2148 (ARM7) microcontroller programs are developed in Embedded C. Flash magic is used for loading programs into Microcontroller.Sirsath N. S, proposed a Home Automation system that employs the integration of multitouch mobile devices, cloud networking, wireless communication, and power-line communication to provide the user with remote control of various lights and appliances within their home.

This system uses a consolidation of a mobile phone application, handheld wireless remote, and PC based program to provide a means of user interface to the consumer [1]. Basil Hamed, described the design and implement a control and monitor system for smart house. Smart house system consists of many systems that controlled by LabVIEW software as the main controlling system in the paper. Also, the smart house system was supported by remote control system as a sub controlling system. The systemalso is connected to the internet to monitor and control the house equipment's from anywhere in the world using LabVIEW [2].DeepaliJavale, presents assist to handicapped/old aged people. It gives basic idea of how to control various home appliances and provide a security using Android phone/tab. The design consists of Android phone with home automation application, Arduino Mega ADK. User can interact with the android phone and send control signal to the Arduino ADK which in turn will control other embedded d devices/sensors [3].Mohammad El-Basioni, proposed a new design for the smart home using the wireless sensor network and the biometric technologies. The system employs the biometric in the authentication for home entrance which enhances home security as well as easiness of home entering process.

The structure of the system is described and the incorporated communications are analyzed, also estimation for the whole system cost is given which is something lacking in a lot of other smart home designs offers.WB-SH is designed to be capable of incorporating in a building automation system and it can be applied to offices, clinics, and other places. The paper ends with an imagination for thefuture of the smart home when employs the biometric technology in a larger and more comprehensive form. The paper ends with an imagination for the future of the smart home when employs the biometric technology in alarger and more comprehensive form.
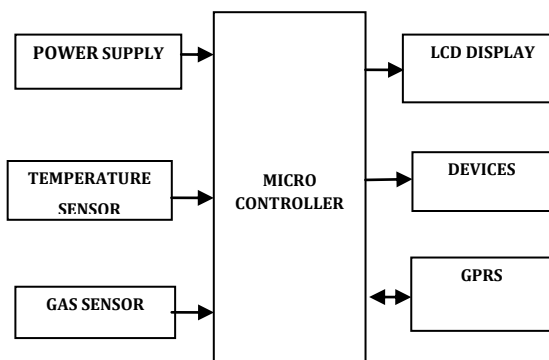
PROPOSED SYSTEM

Fig.1:Block diagram

METHODOLOGY

Micro controller: This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

ARM7TDMI: ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs.

Liquid-crystal display (**LCD**) is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock.

GPRS:

GPRS (general packet radio service) is a packet-based data bearer service for wireless communication services that is delivered as a network overlay for GSM, CDMA and TDMA (ANSI-I36) networks. GPRS applies a packet radio principle to transfer user data packets in an

efficient way between GSM mobile stations and external packet data networks. Packet switching is where data is split into packets that are transmitted separately and then reassembled at the receiving end. GPRS supports the world's leading packet-based Internet communication protocols, Internet protocol (IP) and X.25, a protocol that is used mainly in Europe. GPRS enables any existing IP or X.25 application to operate over a GSM cellular connection. Cellular networks with GPRS capabilities are wireless extensions of the Internet and X.25 networks.

Fig.2: GPRS module

Temperature sensor:

A thermistor is a type of resistor whose resistance is dependent on temperature. Thermistors are widely used as inrush current limiter, temperature sensors (NTC type typically), self-resetting over current protectors, and self-regulating heating elements. The TMP103 is a digital output temperature sensor in a four-ball wafer chip-scale package (WCSP). The TMP103 is capable of reading temperatures to a resolution of $1°C$.

Fig.3: Temperature sensor

Co2 sensor:

They are used in gas leakage detecting equipments in family and industry, are suitable for detecting of LPG, i-butane, propane, methane, alcohol, Hydrogen, smoke. The surface resistance of the sensor Rs is obtained through effected voltage signal output of the load resistance RL which series-wound. The relationship between them is described:

$Rs\backslash RL = (Vc-VRL) / VRL$

Fig .4: Co2 sensor

CONCLUSION

Home networking and architecture design are very important for a smart home automation

system. The interfacing of sensors and microcontroller with raspberry pi is successfully simulated and tested for all smart nodes along with feature of remote controlling using Android application. With successful design and testing of hardware, this project proves to be very useful in daily home management with increased smartness with usage of smart devices.

REFERENCES

[1] Y. T. Park, P. Sthapit, and J.-Y. Pyun, "Smart digital door lock for the home automotion", in Proc. IEEE TENCON Conference, pp 1-6. 2009.

[2] K. Atukorala, D. Wijekoon, M. Tharugasini, I. Perera, and C. Silva, "Smarteye – Integrated solution to home automation, security and monitoring through mobile phones".Third International Conference on 1580 IEEE LATIN AMERICA TRANSACTIONS, VOL. 14, NO.4, APRIL 2016 Next Generation Mobile Applications, Services and Technologies. Sep. 15-18, pp. 64-69. 2009.

[3] M. Merabti, P.Fergus, O. Abualma'atti, H. Yu, and C. Judice, "Managing distributed networked appliances in home networks", in Proc., of the IEEE, vol. 96, no.1, pp. 166-185, 2008.

[4] S. Ebrahimi-Taghizadeh, A. Helmy, S. Gupta. "TCP vs. TCP: a systematic study of adverse impact of short-lived TCP flows on longlived TCP Flows". University of Southern California, Department of Electrical Engineering. Los Angeles, USA. 2005.

[5] M. Todorovic, and N. López-Benitez. "Efficiency study of TCP protocols in Infrastructure wireless networks". Texas Tech University, Department of Computer Science. 2006.

[6] A. Kuzmanovic, and E. W. Knightly, "TCP-LP: Low-Priority service via end-point congestion control". *IEEE/ACM Transactions on Networking*, Vol. 14, No. 4, 2006.

[7] Y.-T. Li, D. Leith, and R. N. Shorten. "Experimental evaluation of TCP protocols for high-speed networks". *IEEE/ACM Trasactions on Networking*, vol. 15, no. 5, pp. 1109-1122. 2007.

[8] S-C. Tsao, Y-C.Lai, Y-D. Lin. "Taxonomy and evaluation of TCPfriendly congestion-control schemes on fairness, aggressiveness, and responsiveness". *IEEE Nerwork,* vol 21. No.5, pp. 6-15. 2007.

[9] S. Henna. "A Throughput analysis of TCP variants in mobile wireless networks". Third International Conference on Next Generation Mobile Applications, Services and Technologies. Sep. 15-18., pp. 279-284. 2009.

[10] X. Miao, Q. Feng, D. Ping, Q. Yajuan, Z.Sidong, Z.Hongke. "Fairness Evaluation of the Default High-Speed TCP in Common Operating Systems". Proceedings of IC-BNMT2009., pp.100-105. 2009