The Bluenet Switch Control Network Based on CAN and Android

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Abstract: Home automation is the residential extension of "building automation". It is automation of the home, housework or household activity. Home automation may include centralized control of lighting, HVAC (heating, ventilation and air conditioning), appliances, and other systems, to provide improved convenience, comfort, energy efficiency and security. Home automation for the elderly and disabled can provide increased quality of life for persons who might otherwise require caregivers or institutional care. Usually the home automation has been done by Internet with PC, signal based technology such as GSM, in these protocols the data rate is low which leads to slow operation of electrical equipments. To overcome this limitations propose a system, automation of home is done by android mobile phones with Bluetooth communication.

Keywords: Bluetooth, CAN protocol

I. INTRODUCTION

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. Through the integration of information technologies with the home environment, systems and appliances are able to communicate in an integrated manner which results in convenience, energy efficiency, and safety benefits. Home automation refers to the employment of computer and data technology to manage home appliances and options (such as windows or lighting). Systems will vary from easy remote of lighting through to advanced computer/micro-controller based mostly networks with variable degrees of intelligence and automation. Home automation is adopted for reasons of ease, security and energy potency. In trendy construction in industrial nations, most homes are wired for wattage, telephones, TV retailers (cable or antenna), and a push. several tasks were automatic by the event of specialised automatic appliances. as an example, automatic laundry machines were developed to cut back the labour of cleanup garments, and water heaters reduced the labour necessary for bathing. the employment of vaporous or liquid fuels, and later the employment of electricity enabled magnified automation in heating, reducing the labor necessary to manually refuel heaters and stoves. Development of thermostats allowed a lot of automatic management of heating, and later cooling. because the range of governable devices within the home rises, interconnection and communication becomes a helpful and fascinating feature. for instance, a chamber will send associate degree alert message once it wants cleanup, or a

white goods once it wants service. If nobody is meant to be home and also the alarm is about, the house automation system may decision the owner, or the neighbors, or associate degree emergency range if associate degree entrant is detected. In easy installations, automation is also as easy as turning on the lights once an individual enters the area. In advanced installations, rooms will sense not solely the presence of an individual within however apprehend WHO that person is and maybe set acceptable lighting, temperature, music levels or tv channels, taking under consideration the day of the week, the time of day, and alternative factors.

II. RELATED WORK

In existing system the home automation has been done by Internet with PC, signal based technology such as GSM, and some other RF protocols such as zigbee, Miwi. But in GSM based automation the signal level should be a consideration one for the reliable operation. The signal sent from GSM-enabled phones causes interference on electronic devices. Due to this EMI, operating of electrical equipments may be wrong. In the above protocols the data rate is low which leads to slow operation of electrical equipments.

In 1991, Ad van Berlo setup a practice workplace for helpful technology within the care sector. He switched from the globe of medical technology (cure) to the globe of care technology. the sector of 'gerontechnology' was powerfully rising, that is technology aimed toward creating the lives of older folks easier and softer. metropolis University of Technology started gerontechnology within the 90s as a replacement analysis space and residential technology was one in every of the most sub-disciplines. Later, this was known as home automation. France and Belgique use the term 'domotique' and within the Kingdom of The Netherlands it's known as 'domotica'. within the early 90s, folks couldn't nonetheless imagine what home automation would entail. there have been PCs however no one knew regarding mobile telephones and therefore the web. within the Nineties, varied comes transpire within which older folks might really expertise what home automation had to supply.

In 1998, Corien van Berlo, Ad's partner, setup good Homes in conjunction with her husband. The aim was primarily to additional the promotion of home automation, execute demonstration comes and begin experiments. to the current finish, good Homes provided support to all or any pilots commissioned by the Brabant province. These demonstration comes were finished in 2000 and 2001, however the importance of those comes

continues to be monumental. the need of a system integrator's participation has been incontestable . partially as a result of this, the availability of technology providing higher and cheaper solutions has embarked on powerfully.

The breakthrough in home automation that emerged tentatively in 2001 saw the Van Berlos use employees for good Homes for the primary time and build the best Home of Netherlands. Through cooperation with several participants, to whom good Homes is incredibly grateful, the considerably revived demonstration home was opened in Tilburg at the top of 2001. The exceptional issue regarding this fully livable house is the combination of the four pillars: industrial, versatile and demountable (IFD) building, home automation, durability, and accessibility

III. PROPOSED SYSTEM

In this project automation of home is done by android mobile phones with Bluetooth communication. **Android** is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers with the Open source. Bluetooth and CAN protocol has used for reliable operation of data transmission. Bluetooth is standardized wireless guarantees the high level of compatibility among devices. Bluetooth devices connect to each other irrespective of their model. Bluetooth with the help of low power signals technology requires very less energy reducing the battery consumption or electrical power. CAN protocol is a two wire bus protocol which reduces the wiring complexity and easy to manage the data transmission with high speed.
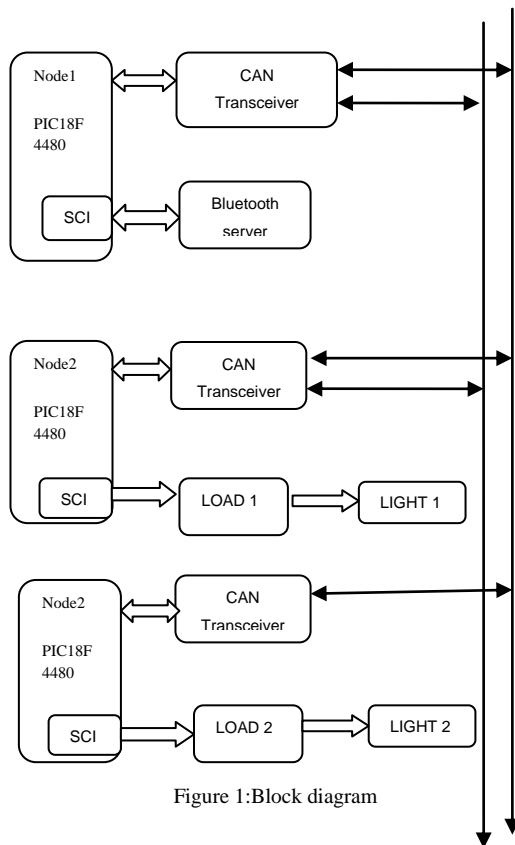

Figure 1:Block diagram

A.Working

In this project, android phone and microcontroller takes as main role of commanding and controlling operation. The electrical unit having microcontroller, CAN bus with electrical load. All electrical loads are connected through the CAN bus with a controlling module which consists of PIC microcontroller, CAN controller and transceiver. To make the controlled reliable operation, android has been employed. The communication between mobile and PIC controller has been taken place by Bluetooth. With the use of Bluetooth software in phone the command is given to loads. For the specified commands the loads can be turned on or turned off.

B. Flow Diagram of the Proposed System
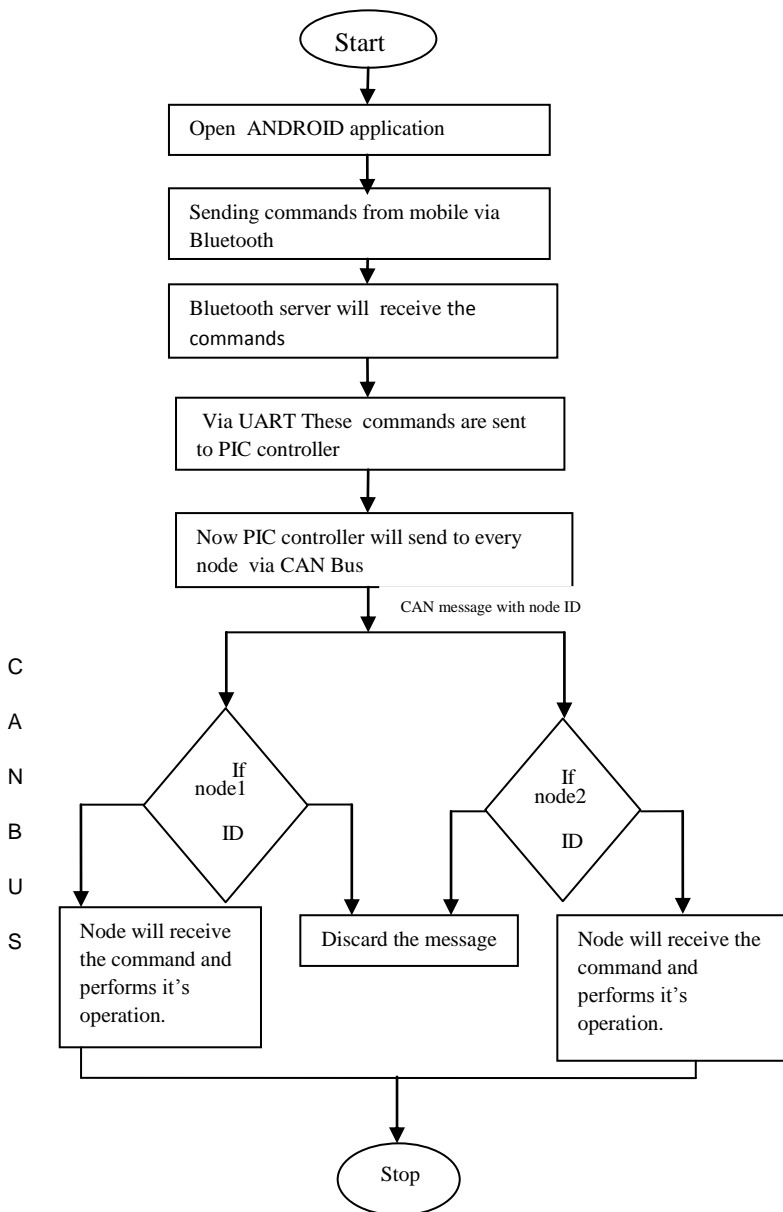
C. Algorithm

i.   Start.
ii.   Next open the android application in your mobile.
iii. Send the commands from ANDROID mobile to Bluetooth server through Bluetooth Protocol.
iv.   Bluetooth server will receive the commands from mobile.
v.   After that those commands are passed to PIC controller by using UART.
vi.   Then PIC controller will send to every node via CAN Bus as CAN frames.
vii. Then every node filters that CAN commands by using filters to check the commands.
viii. If the CAN message ID is matching with filter ID then it will receive the CAN frame,else discard the message.
ix.   After receiving message that particular node will perform according to received command.
x.   Stop

IV.   RESULTS AND DISCUSSION

This project has implemented the home intelligent network by controlling the system through the switches. The PIC controller we have used here is PIC18F4480 which is containing the internal ECAN module. And we have provided the wireless communication by using Bluetooth module between the ANDROID mobile and hardware module.

The main protocol which is passing the commands to every node from main or master node called CAN BUS. And this bus is good solution to avoid problems in sending the data to nodes.
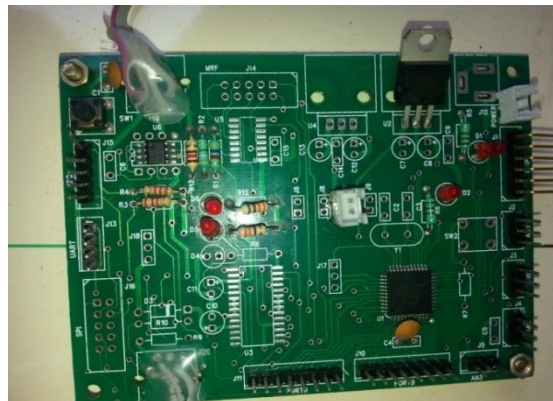
Master Node:

This is the main node in this project means which has to control the remaining nodes by sending the commands. This contains the Bluetooth server , needs to receives the data from the ANDROID mobile as shown above. The PIC18F4480 controller also be placed in this master node which is the heart of the system.

Client Node:

This is the client node which means the node which is received the data from the main node. This module contains the two devices those are light and fan as shown above figure.

OUTPUTPORTS

Here this node receives the data from master node and according to that it will operate either fan or light. In our project we have taken two nodes those are containing two lights. And these client nodes are connected each other through CAN Bus and also connected to master node. If we need then can connect the more devices

Total System:

Here we can see the full embedded modules and the connection between them. This figure contains one master node and two client nodes. This system contains the led and one fan for each node. Those led are used to check the whether the light is operated by mobile are not and fan also used for the same purpose.

V. CONCLUSION

The implementation of home intelligent switch control network by using different protocols like Bluetooth, CAN Bus. In order to provide wireless communication Bluetooth has used that is to transfer the data from android mobile to the hardware system.

Here the main module is PIC Controller that is PIC18F4480 controls the entire system. And by using android mobile we can pass the commands so after receiving those commands it will operate the nodes. Here we have controlled two devices fan and light as said before. We can control some more nodes by adding to CAN Bus up to 2048 devices. We can control like air conditioner, and temperature controller etc.

This system can be used for the other purposes also like industries and companies, factories where is the need of controlling of more no of electronic devices. By using this system there is a possibility to implement different applications like controlling home theatre and check the whether door closed or not, whether children reached room are not.

VI. ACKNOWLEDGEMENT

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VII. REFERENCES

[1] B. van Tuijl, E. van Os, and E. van Henten, "Wireless sensor networks:State of the art and future perspective," in Proc. Int. Symp. High Technol.Greenhouse Syst. Manage. (Greensys), 2007, pp. 547–554.

[2] Frank, Understanding smart sensors,Norwood, MA: Artech House, 2000.

[3] Jordan, J. R.Serial Networked Instrumentation,New York: Wiley, 1995.

[4] Jose M. Giron-Sierra, Member,IEEE ; C.Insaurralde, Member, IEEE; M.Seminario; J. F. Jimenez; Universidad Complutense de Mad Spain PETER KLOSE ;Autoflug Industriestrasse,Germany. "CAN Bus-Based Distributed Fuel System with Smart Components" VOL. 44, NO. 3, JULY 2008,1-16.

[5] Kyung Chang Lee, Associate Member, IEEE, Hong-Hee Lee, MEMBER,IEEE "Network-based Fire-Detection System via Controller Area Network For Smart Home Automation" July 29, 2004, pp.1-8.

[6] N. Sriskanthan, F. Tan, and A. Karande, "Bluetooth based home automation system," Microprocessor. Microsyst., vol. 26, 2002, pp. 281-289.

[7] Orazio Mirabella, Senior Member, IEEE, and Michele Brischetto Hybrid Wired/Wireless Networking Infrastructure for Greenhouse Management" VOL. 60, NO. 2, FEBRUARY 2011, pp.1-10.