

HOME AUTOMATION USING GSM

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Abstract

We all know that we are in 21st century and we know that technology have improved a lot from the past century. Home Automation is one of the improved technology. Home Automation is playing a dominant role in human life. Home Automation allows us to control the working of household appliances like Air conditioner and all Electric controlled appliances. It also provides security and also saving of power. By using this Home automation human efforts can be reduced and also provides improvement in energy and time utilization. Actual use of Home Automation is to offer help for old and handicapped people which able them to control home appliances and alert in critical situation.

This paper put forward the prototype for the designing of Home Automation using GSM. As from the previous design the one of the problems they faced are cost so our design uses a small scale processor either 8051 mc. The design is based on the standalone embedded system development board and GSM Module. Home Appliances are connected to the development board and these appliances are controlled by using our normal phones. Choosing the device with less cost and scalable to less modification to the core is very important.

Keywords: *Gsm, Automation, Development board, Mobile Phone.*

I. INTRODUCTION

Home automation is the automation of home, housework or any other household activity. It defined a system enabling user to remotely control objects present in your home. Thus,

making your home environment smarter. Home automation may include control of electric devices like Air Conditioner, WaterMotor, MicroOven, WashingMachine and other systems, to provide more convenience, comfort, energy efficiency and security. Discussion on the concept of home automation has been there for a long time. A lot of models are proposed but almost all are failed because of cost of the device is more. But there is no solution to overcome from this problem. Home automation for the elderly and disabled can provide best quality of life for persons who don't have caregivers or institutional care. A remote interface can also be provided to home appliances via mobile phone of any type that accepts SIM card. This paper will describe the prototype for controlling home appliances through Mobile Phones.

II. LITERATURE SURVEY

As we said prior that considering the past papers on home automation at present there exists no framework at less expensive rates. Different frameworks are tricky to introduce, hard to comprehend and hard to utilize and keep up. Current frameworks are by and large exclusive and shut, not extremely adaptable by the end client.

N.Sriskanthan explained the model that describes about the home automation using bluetooth via PC. But failed due to lack of support for mobile phone.

Deepali Javale explained the model that shows how home automation and System Security using ADK is implemented and it's working.

Izhar Ramli planned a model electrical gadget control framework utilizing Web. Be that as it may fizzled due to server issues.

Hasan developed a remote controlled device using PIC controller for controlling the devices through wired communication.

G Pradeep proposed home automation system by using Bluetooth with improvement in power utilization and time consumption.

Al-Ali and Al-Rousan presented a designed a Java-based automation system through World Wide Web(WWW).

Piyare.R have introduced design and implementation of a low cost, flexible and wireless solution to the home automation



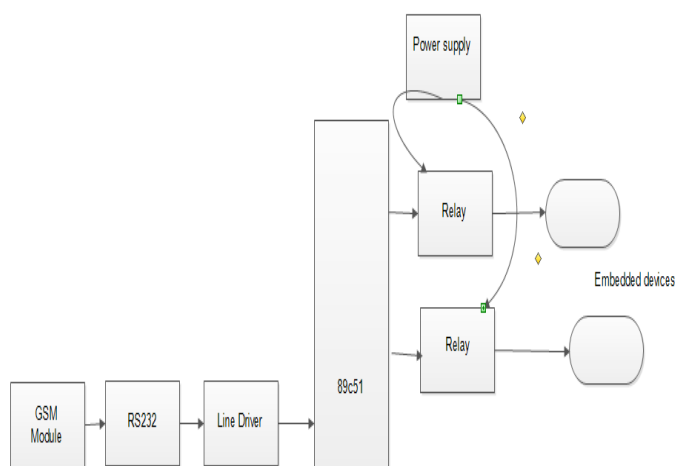
Figure 1. Home automation system block diagram by R. Piyare[12]

Google and Microsoft entered into the home automation domain in the year 2011. At 2011 I/O conference google announced that they are working to develop an operating system for home automation.

Microsoft also working on a project called HomeOS,(an operating system for the home Automation)[5].

III.IMPLEMENTATION

Block Diagram:



A. GSM Module:[6]

GSM remains for Global System Mobile Communication. This GSM Modem acknowledge any GSM system Operator SIM card.

Through this SIM card client can correspond with the Development board from which the control signs will goes to the obliged gadget. GSM Module have a space to embed any system administrator SIM card. GSM modem is a very adaptable fitting for immediate and simple combination to Rs232 applications. Backings gimmicks like Voice, SMS, Fax, GPRS and incorporated TCP/IP stack.



Fig: Represents the Physical structure of GSM module

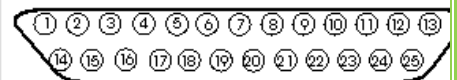
B. RS232:

Generally communication can be done in two ways they wired and wireless. Wired Communication means two or more devices share information through wires or cables. Wireless communication means sharing the information with the medium as air. Controller can communicate with the peripherals either serially or parallel.

In parallel communication all bits are send at a time it is the advantage with parallel communication but it requires more data lines to send data. Where as in serial communication the bits are transferred one after the other so the throughput is less but it require single line to transfer the data. One of the serial correspondence convention is Rs232. Rs232 remains for Recommended Standard number 232. The full RS-232c standard details a 25-pin "D"connector of which 22 pins are utilized. The majority of these pins are not required for ordinary PC correspondences, and surely, most new Pcs are furnished with malesortconnectors having just 9 pins.

25 Pin Connector on a DTE device (PC connection)

Male RS232 DB25



9 Pin Connector on a DTE device (PC connection)

Male RS232 DB9

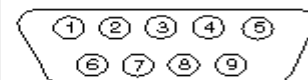


Fig: Represents the connectors for serial communication

C. Line Driver

In gadgets, a line driver is an intensifier used to enhance the quality of a simple or advanced sign at its source by driving the info to the transmission line with a higher than typical sign level. This expands the nature of a transmission over a long run of link. A sample of a line driver is an enhancer used to broaden the scope of a RS-232c advanced flag past 15 m (50ft) while keeping up a tagged bit slip degree.

We are using Line driver because the inputs and output voltage levels are not TTL (Transistor to Transistor Logic) compatible. In RS232, a 1 is represented by -3 to -25 v, while a 0 bit is +3 to +25 v. But Microcontroller is TTL Compatible. In TTL bit 1 is represented by +5 v and bit 0 is represented by 0v. So in order to convert RS232 voltage level equal to TTL levels a Line Driver (MAX 232) is used.

D. 8051 MC:[1]

- ✓ 8-bit microcontroller
- ✓ 8-bit CPU, Reg A, Reg B
- ✓ 4 I/O ports(8-bit ports)
- ✓ 15-bit PC and Data Pointer (DPTR)
- ✓ 8-bit PSW
- ✓ 8-bit SP
- ✓ Internal ROM and EPROM (8751)
- ✓ Internal RAM of 256 bytes

It is 8-bit microcontroller, implies MC 8051 can Read, Write and Process 8 bit information. This is generally utilized microcontroller as a part of the mechanical technology, home machines like mp3 player, clothes washers, electronic iron and businesses.

MC 8051 has 128 byte Random Access memory for information stockpiling. Irregular access memory is non unstable memory. Amid execution for putting away the information the RAM is utilized. ROM comprises of the register banks, stack for brief information stockpiling. It likewise comprises of some uncommon capacity register (SFR) which are utilized for some particular reason like clock, info yield ports and so

forth. Regularly microcontroller has 256 byte RAM in which 128 byte is utilized for client space which is regularly Register.

E. Realy IC:[2]

Relays are electromechanical gadgets that utilize an electromagnet to work a couple of versatile contacts from a vacant position to a shut position. The point of interest of Relays is that it takes a generally little amount of power to work the relay coil, however the hand-off itself can be utilized to control engines, warmers, lights or AC circuits which themselves can draw a great deal more electrical force.

The Electro-mechanical Relay is a yield gadget (actuator) which arrive in an entire host of shapes, sizes and outlines, and have numerous uses and applications in electronic circuits. Anyway while electrical transfers can be utilized to permit low power electronic or machine sort circuits to switch generally high flows or voltages both "ON" or "OFF", some type of transfer switch circuit is obliged to control it.

The outline and sorts of hand-off exchanging circuits is gigantic, however a lot of people little electronic activities use transistors and Mosfets as their fundamental exchanging gadget as the transistor can give quick DC exchanging (ON-OFF) control of the hand-off loop from a mixed bag of info sources so here is a little accumulation of a portion of the more normal methods for exchanging transfers.

IV. WORKING

Before Discussing regarding working just look out how the routing is done between the components. Check the connections from the Controller because controller is the heart of the Circuit. As stated above that 8051 mc consists of 4 I/O ports each of 8 bit. Our devices to be controlled are connected to the Microcontroller through the Relay IC which in turn connected to the I/O ports of Microcontroller. GSM module is connected to the controller through serial communication and also through Line Driver. Serial Port of GSM module is connected to the RS232 and the RS232 is connected to the Port of line Driver which in turn connected

To the serial port of 8051 controller. The usage of all this devices are mentioned earlier.

When Coming to Working. After connected all the devices as per the block diagram shown above. User inserts the network operator SIM card in the provided slot of GSM Module so that user can control the devices by sending the messages to that controller. So the user sends the message to the SIM that "ON the Device 1" so the user send the message like this. Then the device Gsm module sends the message that it had received to the microcontroller then microcontroller compares the message with the predefined message if the incoming message matches with any message that is stored in the microcontroller memory then it takes the action as per the user defined in the code like if the user treated the device one as fan then the controller reads the message "ON Device 1" then microcontroller gives the signal the relay that is connected to the fan then the relay connects the power cord so that power is given to the fan then the fan will rotate in this based on the user requirement the controller takes the action.

We can also implement door lock security using this system. By connecting the motor of the lock to the relay so that when the user wants to open the lock user sends the message like "Lock Open" the motor rotates and the door will be open. So by using this system we can provide security to the devices also.

In the similar manner if the user wants to switch off the working devices by sending the corresponding message that is defined

by the user for that action. If the Message send from the Different user or the message send is not belongs to the predefined messages then the controller will not react to that message.

This is the Working of the prototype that we have designed.

V. APPLICATIONS

Emulating are the applications of Home Automation and Security System

1. Medical caution/ tele assistance.
2. Precise and safe visually impaired control.
3. Detection of flame, gas breaks and water spills.
4. Smoke locator can locate a flame or smoke condition, bringing on all lights in the house to squint to alarm any individual of the house to the conceivable crisis.
5. The framework can call the property holder on their cell telephone to caution them, or call the blaze office or alert observing organization [7]
6. Lighting control, it is conceivable to spare vitality at the point when hours of squandered vitality in both private and business applications via auto on/off light at evening in all real city of ce structures, say after 10pm.
7. Control and joining of security frameworks furthermore the potential for focal locking of all edge entryways and windows. [7]
8. Security cams can be controlled, permitting the client to watch movement around a house or business right from a Screen or touch board.
9. Security frameworks can incorporate movement sensors that will locate any sort of unapproved development and tell the client through the security framework or by means of PDA.
10. A radio framework permits correspondence by means of a mouthpiece and uproarious speaker bet

VI. FUTURE SCOPE

We can extend the above prototype by sending the acknowledgement to the user when the action is taken for example like "Fan is in On state". Means we can provide a feature for sending acknowledgement to the user by adding other peripherals.

Constraint to control just a few gadgets can be uprooted by broadening computerization of all other home Machines. Security cams can be controlled, permitting the Client to watch action around a house or business. Security Frameworks can incorporate movement sensors that will identify any sort of unapproved development and advise the client. Extent of this task can be stretched to numerous territories by not confining to just home

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