GSM Based Home Automation System

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Abstract:
The main objective of this project is to develop a home automation system using an arduino board with GSM being remotely controlled by any android OS Smartphone. As technology is advancing so houses are also getting smarter. Modern houses are gradually shifting from conventional switches to centralized control system, involving remote controlled switches. Presently, conventional wall switches located in different parts of the house makes it difficult for the user to go near them to operate. Even more it becomes more difficult for the elderly or physically handicapped people to do so. Remote controlled home automation system provides a most modern solution with smart phones. In order to achieve this GSM module is interfaced to the arduino board at the receiver end while on the transmitter end, a GUI application on the cell phone sends on/off commands to the receiver where loads are connected. By touching the specified location on the GUI the loads can be turned off/on remotely through this technology. These loads are operated by arduino board through optoisolators and thyristors using triacs. This device needs to be mounted on user finger of hand. The user now just needs to tilt the device in a particular angle to convey a message.

I. INTRODUCTION

The project aims at a system allowing user to control home based appliances through Sms along with acknowledgements. Here user need not switch home appliances on and off manually. Our system allows user to operate these devices through sms, also the status weather the device is switched on or not is sent to user via a return sms. This can be used by domestic users and company users to operate as well as check status of home and company appliances from anywhere in the world. It is a very convenient system for users since it allows them to easily control and monitor these appliances from anywhere. An example is that a person may switch on his House or office AC 15 minutes before he arrives so that he gets a cool environment as soon as he reaches there. The system works in the following manner; the sms sent by user is received by the Gsm receiver and then sent to an 8051 microcontroller in order to process it. The microcontroller then activates the appropriate relay for that appliance and controls it. The principle in which the project is based is fairly simple. Firstly, the DTMF TONE is sent via the mobile keypad and then it is decoded through a decoder and sent to the intermediate hardware that we have designed according to the command received in form of the DTMF TONE.

2. SMART HOME ARCITECTURE

The system being proposed consists basically of a central unit and peripherals (equipment and sensor boards). Fig.1 shows the smart home control system being proposed.

As shown in this figure the contact between the entities of the home In the home network, ZigBee protocol and XBee modules are used to ensure this. Users have the possibility to control and monitor the home’s equipment and devices through a developed user interface. The process of controlling and monitoring is done either locally via Wi-FI and LAN network or remotely via internet. If the remote user does not have an internet and wants to execute commands.

3. DISCUSSION

ZigBee network aims at low volume, low cost and low power consumption. The ZigBee format is designed for the functions of monitoring and controlling applications. For these purposes, the ZigBee standard is chosen for wire and wireless standards among others. XBee products are selected to fulfill the need for a wireless home network and enforce the ZigBee standard. To configure the X-CTU software, in the embedded server, data collected from XBee routers and user-received and initiated commands are handled and interpreted. Based on different java libraries in this paper, The arduino plays the role of a gateway that allows translating information from ZigBee to TCP/IP protocol or vice versa. Also a conversion from ZigBee to GSM is expected, or vice versa. Unlike control systems cited above, we presented in this paper, two possible ways of monitoring and control process; through internet based on REST web services or through an alternative solution which is GSM. The GSM is solicited rarely and is considered as an alternative solution to the internet connectivity. The
commands that transit over GSM are reduced, hence the indirect cost resulting from sending and receiving SMS is minimized.

4. PROBLEM DEFINITION

Resources are exhausted when it is being utilized quicker than it can recharge itself. The modern transformation is the point at which everything started. As our way of life progressed and our species designed numerous things that will make our lives less demanding, our interest for crude materials expanded significantly. We get these resources from the other. The issue is, we’re utilizing excessively and without mind. Our planet can’t stay aware of our regularly expanding requests. Natural Resource depletion is the utilization of a resource quicker than it can be renewed. Environment Specialist Narendra Singh Plaha says normal resources are usually isolated between inexhaustible resources and non-sustainable resources. Utilization of both of these types of resources past their rate of substitution is thought to be resource depletion. Resource depletion is utilized as a part of the reference to cultivating, angling, mining, water utilization, and utilization of petroleum derivatives. Natural resources incorporate water, fuel, soil, land, and air. Depletion of these resources produces rivalry among living life forms for the rest of the bits and reduces the nature of accessible resources. Of the life-supporting natural resources for people, plants, and creatures, water positions high on the list of the most fundamental and vital components. Certain human-caused exercises decrease the nature of protected and available drinking water. A diminished water quality presents issues encompassing well-being and welfare, particularly in the blend with excessively or too little water. Weakened water quality makes drinking water more costly for individuals and less promptly accessible. Through tempest water overflow, and also modern waste emanations and manures sullied water enters streams and waterways, at last imperiling the wellbeing and imperativeness of marine biological communities. Abuse of petroleum products decreases their accessibility and further more brings destructive poisons into conduits and the environment. Deforestation and horticultural exercises intensify disintegration and cause soil sullying, which weakens the survival limit of plants, and makes encompassing territories inclined to flood and natural disasters. As our way of life progressed and our species designed numerous things that will make our lives less demanding, our interest for crude materials expanded significantly. We get these resources from the other. The issue is, we’re utilizing excessively and without mind. Our planet can’t stay aware of our regularly expanding requests. Natural Resource depletion is the utilization of a resource quicker than it can be renewed. Environment Specialist Narendra Singh Plaha says normal resources are usually isolated between inexhaustible resources.

5. EXISTING SYSTEM

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6. PROPOSED SYSTEM

Connections of this GSM based home automation circuit are quite simple, here a liquid crystal display is used for displaying status of home appliances which is directly connected to arduino in 4-bit mode. Data pins of LCD namely RS, EN, D4, D5, D6, D7 are connected to arduino digital pin number 6, 7, 8, 9, 10, 11. And Rx and Tx pin of GSM module is directly connected at Tx and Rx pin of Arduino respectively. And GSM module is powered by using a 12 volt adaptor. 5 volt SPDT 3 relays are used for controlling LIGHT, FAN and TV. And relays are connected to arduino pin number 3, 4 and 5 through relay driver ULN2003 for controlling LIGHT, FAN and TV respectively. Fig 2 shows the model of the new system that has been proposed.

![Figure 2](http://ijesc.org/)

SYSTEM SPECIFICATION:

**HARDWARE CONFIGURATION:**

1. Arduino UNO
2. Bread board
3. GSM Module
4. ULN2003
5. Relay 5 volt
6. Bulb with holder
7. Connecting wires

7. RESULT AND DISCUSSION:

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8. CONCLUSION:

The main objective of this project is to develop a home automation system using and arduino board with GSM being remotely controlled by any android OS Smartphone. As technology is advancing so houses are also getting smarter. Modern houses are gradually shifting from conventional switches to centralized control system, involving remote controlled switches. Presently, conventional wall switches located in different parts of the house makes it difficult for the user to go near them to operate. Even more it becomes more difficult for the elderly or physically handicapped people to do so. Remote controlled home automation system provides a most modern solution with smart phones. In order to achieve this GSM module is interfaced to the arduino board at the receiver end while on the transmitter end, a GUI application on the cell phone sends on/off commands to the receiver where loads are connected. By touching the specified location on the GUI the loads can be turned off/on remotely through this technology. These loads are operated by arduino board through optoisolators and thyristors using triacs.

9. REFERENCES:


