HOME AUTOMATION SYSTEM OVER MOBILE NETWORK

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Abstract

IoT is a domain where millions and millions of objects are there which has the capability of sensing, imparting and sharing data over Internet or private networks. You can ring on your associate's versatile number and ask him/her to kill on or the lights or different apparatuses of your office/home. You might be anywhere on the planet around then, as mobile system permits to talk anybody show anywhere in this world. Be that as it may, your partner is a lot for this basic occupation! You may supplant him with this savvy device and let it work the apparatuses. In any case, how it will do that? Will, it will listen to the sound yield from a cell telephone and attempt to perceive the DTMF tones present in the yield sound.

DTMF is an approach to encode numerical information into a perceptible sound which is then sent over a sound channel. Key push on the other versatile will create DTMF codes. Keys like 1, 2, 3 and 4 are utilized to switch on/off up to four burdens like light, fan, and water pump in a building. The client utilizing his cellular telephone calls another versatile, which is available at the home and is connected to this framework, and afterward press keys on his cell telephone to controls the heap in the home. The portable connected to the framework gets tones from the client's versatile and sends them to the DTMF decoder module over a sound link. The DTMF decoder module changes over this tone to a 4 bit twofold number which is then sent to an ATmega8a AVR microcontroller which controls yield transfers utilizing four of its port 16 ounces. These transfers can be utilized to switch AC mains fuelled apparatuses like bulb and fans.

Keyword: Dual Tone Multi Frequency (DTMF), Internet Protocol (IP), Internet of Things (IOT), ATmega8a AVR microcontroller, Relay Module.
I. Introduction

IoT domain has the ability to gather the information, process the activity and make proper administration. With the present progression in remote systems and different advancements executed for mechanization, more creative and enhanced thoughts are produced to construct computerization frameworks encouraging remote controlling and checking of gadgets. In this paper a novel framework is proposed which is an GSM built remote mobile communication framework which controls the apparatus of the home remotely. The proposed framework is agreeable, practicle and it utilizes low power consumption. With the assistance of this framework the client can get to his home apparatuses from anyplace and whenever according to the necessity helping comfort. It likewise empowers the client to screen the status of burdens with SMS overhaulRemote innovation has helped in the field of computerization since quite a while. With the approach of innovation and presentation of system empowered computerization framework in each part, gadgets can be controlled and oversaw from remote area. This can be accomplished by actualizing systems with the backing of different remote advances, for example, ZigBee, Bluetooth, DTMF based versatile and UWB and so on. There has been a quick development and a potential expansion of such computerized frameworks since it encourages the client to compose the apparatuses and gadgets according to his benefit.

II. Literature Review

Carelin Felix proposed an home automation using GSM where the network of gadgets are setup inside the home to achieve high end computerization. In this model the empowered gadgets are controlled by the remote control in addition to Internet. In addition, with the quick extension of the Internet, there is the additional advantage for the remote and checking of such system empowered gadgets. Nonetheless, the selection of home mechanization frameworks has been moderate. This paper distinguishes the purposes behind this moderate selection and assesses the capability of Zig-Bee for tending to these issues through the configuration and usage of adaptable home robotization engineering. Gadget control is a procedure that is done in the everyday existence of humankind. Ordinarily there are various gadgets connected with home and an effective control of these frameworks is a dull assignment. The quickly propelling portable correspondence innovation and the reduction in costs make it conceivable to consolidate versatile innovation into home computerization frameworks. Afshan Mulla proposed a GSM Based Interactive Voice Response System for Wireless Load Control and Monitoring With the present progression in remote systems and
different advancements executed for robotization, more creative and enhanced thoughts are produced to construct computerization frameworks encouraging remote controlling and observing of gadgets. In this paper, a framework is proposed for GSM Controlled home appliances, which executes its capacity of controlling and checking machines remotely. It is consistent, financially savvy, low power utilization; exceedingly productive GSM based remote home framework. The Interactive Voice Response System (IVRS) adorn the framework's security and simplicity of operation. With the assistance of this framework the client can get to his home machines from anyplace and whenever according to the necessity helping accommodation. The framework allows the client direct gadgets through his versatile by sending voice charges utilizing IVRS framework. It likewise empowers the client to screen the status of burdens with SMS redesign. Nicholas Dickey proposed Home Automation using Cloud Network and Mobile Devices in which he stated that smart Mobile phones take care of our daily activities and assignments. A few reports demonstrate that PCs are no more on the main the edge of figuring and the utilization of cell phones are rapidly assuming control. Migration of PCs to multi-touch cell phones is the utilization scenario which uses Cloud Networking. With the accessibility of items which coordinate cell phones and cloud organizing quickly expanding, numerous clients can perceive how new innovation can affect their ordinary lives. The author proposed a home automation framework which uses cell phones with home appliances which has a direct link to the cloud through electric cable and all were controlled remotely. This model has a mobile phone and a remote control connected to PC and has a user interface through which the users can directly interact.

III. Proposed Framework

You can ring on your partner's versatile number and ask him/her to kill on or the lights or different machines of your office/home. You might be anyplace on the planet around then, as versatile system permits to talk anybody display anyplace in this world. However, your associate is a lot for this basic occupation! You may supplant him with this brilliant device and let it work the machines. Yet, how it will do that? Will, it will listen to the sound yield from a cellular telephone and attempt to perceive the DTMF tones present in the yield sound. DTMF is an approach to encode numerical information into a capable of being heard sound which is then sent over a sound channel. Key push on the other portable will create DTMF codes. Keys like 1, 2, 3 and 4 are utilized to switch on/off up to four burdens like light, fan, and water pump in a building. The client utilizing his cell telephone calls another versatile, which is
available at the home and is appended to this framework, and afterward press keys on his cellular telephone to controls the heap in the home. The versatile connected to the framework gets tones from the client's portable and sends them to the DTMF decoder module over a sound link. The DTMF decoder module changes over this tone to a 4 bit parallel number which is then sent to an ATmega8a AVR microcontroller which controls yield transfers utilizing four of its port 16 ounces. These transfers can be utilized to switch AC mains controlled machines like knobs and fans.

**Fig.1: Framework Components.**

### IV. System Configurations

**Software Requirement**

Operating System- Windows7 & above

IDE-Atmel Studio

SinaProg Program Burner

Programmer Driver

Enabled Digital Signature of the system.

**Hardware Requirement**

**Fig.2: 28 Pin Avr Development Board.**
Features:

1. Well-suited with 28 pin chips like ATmega8, ATmega48, ATmega168, ATmega328 etc.
2. Atmel AVR ATmega8 28 PIN microcontroller Involved.
3. 16 MHz crystal for supreme speed.
4. Entire ports offered on standard 0.1inch (2.54mm) male headers.
5. LC Filter on AVcc for clean ADC presentation.
6. Decoupling capacitors on all power pins.
7. Standard ISP Header (Can be automated with our USB AVR Programmer v2.0).
8. On/Off switch.
9. 9-18V DC input.
10. 5v controlled output for providing additional peripherals.(3x).
11. Reset Button.
12. Power Needle LED.
13. Free Prototyping zone for customization(78 holes at 0.1 inch distance)
14. FR4 PCB with solder mask and silk screen.
15. All PCB Pads tinned.

Fig.3: DTMF Module with Audio Cable.

Translates DTMF tones to 4 bit double esteem. Associate this with your PDAs headphone jack (3.5mm), dial your number from another PDA and press any keys. Those keys will be translated to 4 bit values on the DTMF decoder module associated on first mobile phone. This module can be utilized to make portable worked robots and other versatile worked devices.
A hand-off is an electromagnetic switch which will work with a little moderately electric current that can kill on or a much bigger electric current. The heart of a transfer is an electromagnet. You can think about a transfer as a sort of electric lever: switch it on with a small present and it switches on another machine utilizing a much greater current. This component proposes, numerous sensors are inconceivably delicate bits of electronic gear and deliver just little electric streams. In any case, regularly we require them to drive greater bits of device that utilization greater streams. Transfers overcome any issues, making it feasible for little streams to enact bigger ones. That implies transfers can work either as switches which is used for switching ON and OFF or as speakers which changes the tunes of pitch.

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10 PIN FRC Cable with polar female connector on both closures. Polar connector guarantees that link can be embedded just in one bearing keeping away from blunders.

**Fig.7: USB Type Cable.**

This kind of USB link used to interface with an improvement board, USBasp AVR Programmer or any sort of microcontroller to the PC.

**Fig.8: Connecting Wires.**

This linking wires or jumper wires are used to sort physical connection between devices.

**Fig.9: 12V 1A Adapter**
Specifications:

Output Voltage: 12V (+/- 10%)

Max Current: 1A

Fig.10: Mobile Phone with 3.5mm Audio Socket.

In this situation this versatile is utilized to get call from the client end and to produce the sound tones for the DTMF which is associated with the portable by means of Audio link.

Fig.11: 3.5mm Audio AUX Cable.

This 3.5mm bidirectional audial cable used to assemble between cell phone and the DTMF decoder.

Fig.12: Breadboard Is Required For Testing.
For quick prototyping of electronic circuits Breadboard are used.

V. System Testing
Testing is an essential process to check whether the framework is functioning properly or not. Testing can also be used to check the proficiency of the components of the framework which shows the guarantee the framework is working more effectively. Testing is done for all the modules in the framework and the co-ordination between the modules are verified so has to certify that the framework is working very effectively. This above framework has been test in a real time environment with home appliances and mobile which works more accurate.

VI. USE Case Diagram.
Use case charts are proposed to demonstrate the practical prerequisites of the framework. It demonstrates an arrangement of utilization cases and performing artists and their connections. It is constantly chosen to be the begin purpose of programming outline. The accompanying figure demonstrates the utilization case outline of the HACS framework from the end client perspective.

![USE Case Diagram](image)

**Fig.13 USE Case Diagram.**

VII. Conclusion and Future Work
The framework extravagantly depicted in the above areas makes productive utilization of the most recent innovation to help clients to control the operation of home appliances with mobile which are continuously
controlled from remote area. It can be mulled over as an extraordinary answer for the burdens confronted by the tenants of the house who new to the area but rather can control the home appliances using the proposed mechanization. The inactivity included in the execution of the operation is evaluated and the subtle element examination is illustrated.

**Future Work:**

The fundamental disadvantage of this framework is that at whatever point you switch the transfer ON or OFF by what method would we be able to see that whether the chose hand-off is switches or not. To defeat this issue we will propose this framework with some new adjustment. We are attempting to get notice of the transfer switch through SMS administrations utilizing GSM Module. Any sort of GSM module will work, just we have to make physical associations and some consistent. At whatever point we switch transfer ON or OFF as indicated by the given condition, the GSM module will produce a message to the client versatile who is controlling the device from the remote area, and will get message on his portable. In the event that he switches the transfer ON the client will get message says that 'your Load is ON' else it will give message says that 'Your Load is OFF'.

**References**


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