

# SMS Based Home Automation Using Arduino Uno

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## Abstract:

The advancement of remote control innovation has developed quickly alongside the advancement of correspondence innovation these days. The easiest correspondence innovation accessible is by utilizing GSM convention. In this paper, a model of electric machine control device through SMS by utilizing GSM is proposed. GSM convention was picked on the grounds that it doesn't rely upon cell phones' stage. GSM SIM 900 and Arduino for controlling a hand-off module were used here. Hand-off module worked as per orders given through SMS and the cell phone at that point got the input of the summon. For testing reason, ten (10) distinct sorts of information string as a summon control was continue. Hand-off worked as indicated by orders sent from the information string submitted and criticism messages from the order given beforehand was given.

**Keywords-** Arduino; GSM module; electrical appliances control; SMS.

## 1. INTRODUCTION

Home mechanization framework is getting well known and broadly utilized as a part of a great deal of houses around the world. It has huge amounts of points of interest to clients considerably more to the impeded and additionally elderly clients in which it will make it less demanding for them to control their home apparatuses. Home robotization frameworks can be named to two medium in which how it is associated and they are either wired or remotely associated. The fundamental distinction between these two sorts is that home machines are connected remotely a focal controller in the event that it a remote home mechanization framework. Then again, the machines are associated with a focal controller if the medium utilize wired specialized strategy. Remote framework had been acquainted all together with discard wired correspondence among home apparatuses. Arduino based, GSM based home robotization will be connected. These days, everybody can't be isolated from their cell phones. various five thousands people from USA, UK, South Korea, India, China, South Africa, Indonesia and Brazil took a review with respect to which was finished by Time magazine. The outcome demonstrated a large portion of them is indivisible from their cell phones, eighty four percent professedly asserted that get by without their cell phones. Another investigation demonstrates that seventy five percent of the piece of the overall industry is Android and a sum of one hundred and six million android cell phone were transported in the second 50% of 2012. Android cell phone turned into the best working framework in the market in the present time worldwide and it turned into the most famous working framework known to man.

## 2. Methodology

### A. Arduino UNO

In the plan of models we utilize Arduino UNO. Arduino UNO is one of well known Arduino that employments ATmega328 [20]. Arduino UNO has 14 input/output advanced stick (6 of which can be utilized as PWM yields), 6 simple information sources, an oscillator precious stone 16 MHz, a USB association, a power jack, an ICSP header, and a reset catch. The characteristics of the Arduino UNO are below in table I.

Mikrokontroler	ATMega328
Operation Voltage	5 V
Input Voltage	7 – 12 V (recommended)
Input Voltage	6 – 20 (limit)
I/O	14 pin digital input / output (6 pin for PWM) dan 6 pin only for analog input
Current	50 mA
Flash Memory	32 KB
EEPROM	1 KB
Speed	16 Hz

Table I : characteristics of the Arduino UNO

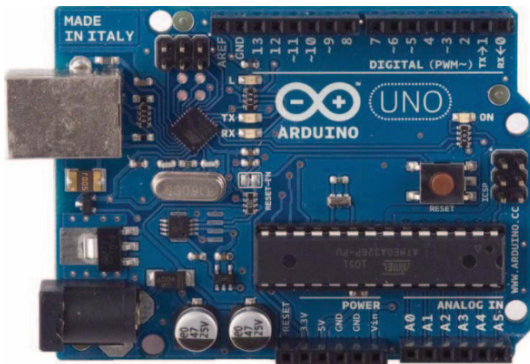


Figure 1. Arduino Uno

### B. SIM900A GPRS/GSM Module

SIM900A widely used in GSM protocol communication[22, 23]. SIM900A is a complete Quad-band GSM / GPRS module in a SMT type and designed with a very powerful single-chip processor integrating AMR926EJ-S core [24]. AGSM module SIM900A has been interfaced with the 32-bit ARM processor-based LPC2148 microcontroller. It is connected to LPC2148 through a USB to RS232 driver. The module contains a SIM card holder, RS232-based serial port for connection, an antenna for sending / receiving signals to the SIM and an LED as a status for power, signal and incoming call. Featuring an industry-standard interface, the SIM900A delivers GSM/GPRS 850/900/1800 / 1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption [23]. It can be seen in Fig. 2.

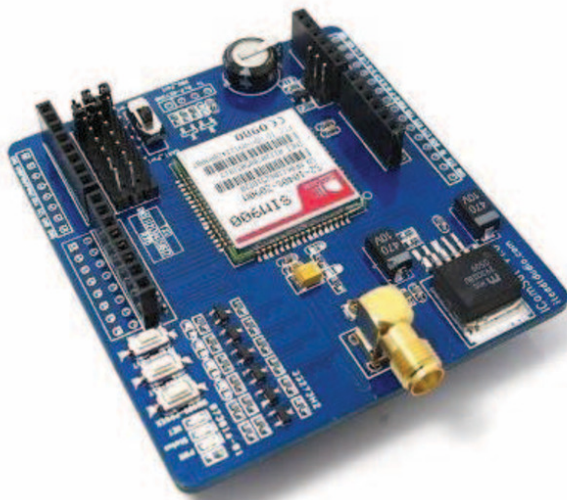


Figure 2. SIM 900 GPRS/GSM module

### C. Relay Module

Relay Module is a module that is extremely viable for utilize as a principle switch transfer for 4 channels venture with microcontroller based electronic circuits. This module turns

on/off other electronic gadgets that are fueled by 240 VAC electrical AC or DC high-voltage gadgets (up to 28 VDC, for example, High Power DC engines. It has a greatest current of 7 Ampere for each direct in [25]. The figure of RM540C Relay Module can be seen in Fig. 3.

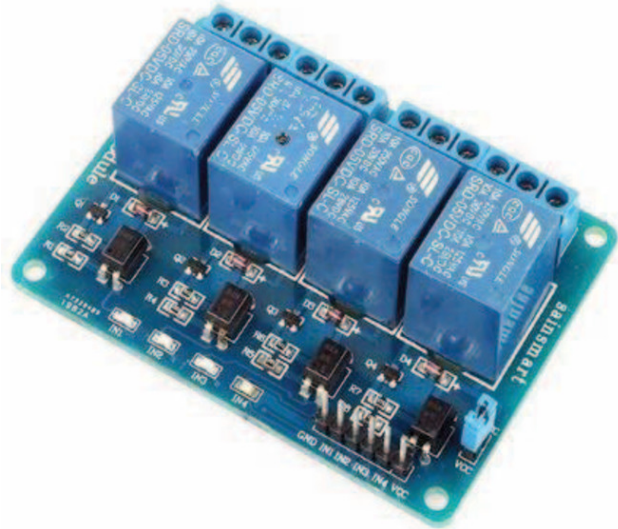


Figure 3. RM540C relay module

### D. Prototype Design

The outline of the model comprises of two phases: the outline and programming of SMS controller circuit and microcontroller. The square graph of framework can be seen in Fig. 4. SIM900 GPRS/GSM Module will be associated with stick Rx/Tx of ATmega328 that contained in Arduino. SIM900 GPRS/GSM Module is utilized to get and send instant messages to cell phones. RM540C Relay Module will be associated with the I/O Arduino stick. RM540C Relay Module will get the requests from the Arduino to turn on or on the other Relay. Schematic SMS controller circuit can be seen in Fig.5.

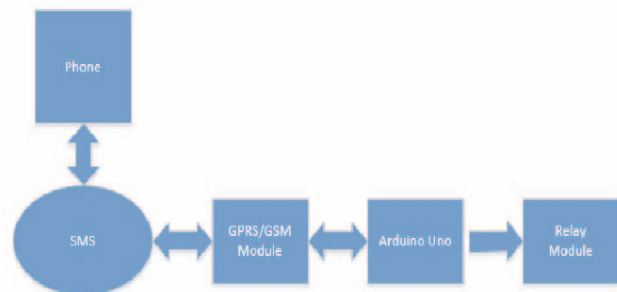


Figure 4. Block diagram of system

Microcontroller writing computer programs is utilized to compose the programming code to decipher input string got from SIM900A GPRS/GSM Module to turn on or off the

Relay. Close to that it is additionally utilized for composing code to send AT commands to SIM900A GPRS/GSM module that will send SMS to cell phones because of charges sent. Past foreordained information string that is utilized to control transfers and criticism from Arduino message educating that the control has been conveyed out.

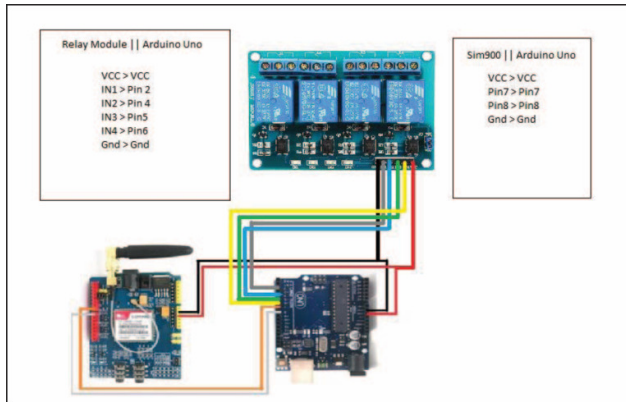


Figure 5. The design of the prototype

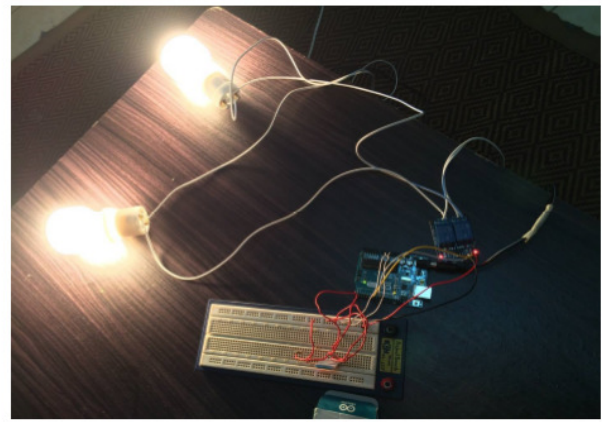
### 3.Result

The system consists of an Arduino microcontroller as control, SIM900 as SMS gateway, Relays as outputs and phones as input. The working principle is Arduino will receive input in the form of a string of data from mobile phones via SMS gateway. Then Arduino will process the data and control relay in accordance with the data. If the relay is ON, the electrical equipment such as lights, fans, and others will be ON as well and also if the relay off the electrical equipment will be off as well.

### 4. OUTPUT

The HOME AUTOMATION SYSTEM USING ARDUINO and it was user friendly and cost effective. User friendly as in anyone can use just send an SMS from mobile phone and everything works. And it is cost effective as in it will cost exactly as the project require.

Figure: Shows the prototype of the system.



### 5.Conclusion

It can be concluded that HOME AUTOMATION SYSTEM USING ARDUINO was a success. This system consists of an Arduino-Uno board, a GSM Module, an Android phone, power sockets, home appliances. By using SIM900 GPRS GSM Module and Arduino, a relay module controlled by SMS has been designed.

Also it can be concluded that the objectives of this project has been successfully met and they are as follows:

- (a) Designed and implement cost effective home automation system yet an efficient one.
- (b) Designed a user friendly and a safe system to control home appliances especially aimed to aid the elders and handicapped.
- (c) If some one is very hurry and by mistake forgot to close any electrical appliance of home Example : A/C then the one can send sms from outside home to get shut down that electrical appliance.

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