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DESIGN & PROTOTYPE IMPLEMENTATION OF SMS BASED SMARTPHONE

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ABSTRACT

Users with a simple, fast and reliable way to put up important notices in an LCD where the user can send a message to be displayed in the LCD. The message can be sent through an android application designed in this project, to the GSM SIM900 module which has a SIM card inside it. Similarly, a home automation system has been developed where home appliances like light, fan etc. can be switched on or off using the same android application designed in this project. So, using the android application, the home appliances can be controlled and notices can be put up in an LCD display from any location in the world. It uses a microcontroller for system control, GSM technology for communication and sends SMS containing the message through the android application. The project consists of a 32-bit ARM based microcontroller LPC2148, GSM SIM900 module, an LCD, a motor and an android application for user interface with the hardware. The device can be used anywhere irrespective of the place of deployment provided mobile network connectivity isavailable.

INTRODUCTION

During the present days technology is all about the automation and wireless control of all the equipment used in industries, factories and households. Any equipment that can be controlled wirelessly is more easily maintained and it responds very fast comparing to the manual operation of the equipment. It increases safety as well as speed of operation in times of failure or damage. So here we present a design which uses wireless technology for switching of electrical appliances. This project uses the application of wireless communication i,e. GSM network for the wireless control of the electrical appliances.

In this project the applications of GSM network for the design of a circuit to control the house hold appliances is shown, and also the design of the circuit and method to construct the system using GSM modem and ATmega16 microcontroller is explained. Various uses and limitations of the system are being briefed.

OBJECTIVE

The main aim of the design provided in this project is to develop a device to have wireless control of home electrical appliances. The device can be made sure to be available at a low cost so that everyone can afford it. This is basically a device built for home appliances control system that can provide remote access to house hold electrical appliances at low cost and in efficient way. The electrical devices connected in the home, office or any place, consume electrical power, and there is an absolute necessity of saving of power as per present day situations. So it is necessary to control electrical devices more effectively and efficiently at anytime from anywhere. So this project is built for the sole purpose of efficient control of electrical appliances.

This project is basically built on the process of wireless communication through the GSM network. GSM plays a very important role in the present day life of a person. Each and every person now-a-days has a cell phone with him, and GSM network makes the people across the world to communicate with each other. So as technology is increasing so vastly now-a-days, everything in the world is being automated and wireless for the comfort of man. So here we are building a device based on the GSM network to control the electrical appliances through a cellular phone. Here we are going to design a cell phone based remote control of electrical appliances. This system is designed for controlling arbitrary devices according to the necessity. It includes a cell phone which is connected to the designed system. Basically for the system to work a phone call is made to the designated number or a message is being sent containing a password. As the caller press the specific password, it results in turning ON/OFF of the particular device. The switching of devices is achieved by relays.

GSM TECHNOLOGY

GSM implies worldwide framework for versatile correspondence. GSM is a global advanced cell telecommunication. The GSM standard was proposed by ETSI (European Telecommunications Standard Institute) in 1989. The primary business administration were launched in 1991 and after its initial presentation in Europe, the standard went worldwide in 1992. From that point forward GSM has turned into the most broadly embraced and quickly developing ad-

vanced standard, and it is situated to turn into the world's overwhelming cell standard.

Today's third era GSM systems convey excellent and secure versatile voice and information administrations with full abilities over the world. GSM is a massively fruitful engineering and as uncommon story of worldwide accomplishment. Since the first GSM system was industrially launched, it turned into, the world's heading and fastest developing portable standard. The GSM Association evaluates that advances characterized in the GSM standard serve 80% of the worldwide portable business, including more than 5 billion individuals crosswise over more than 212 nations and domains, making GSM the most omnipresent of the numerous guidelines for cell systems.

Today's GSM stage is living, developing and advancing and as of now offers an extended and characteristic-rich "family" of voice and empowering administrations. The Global System for Mobile Communication (GSM) system is cell telecommunication system with an adaptable structural planning following the ETSI Gsm900/GSM 1800 standard. Seimen's usage is the advanced cell versatile correspondence framework D900/1800/1900 that uses the precise most recent innovation to meet each prerequisite of the standard.

HARDWARE REQUIREMENTS

TRANSFORMER

Transformers convert AC electricity from one voltage to another with a little loss of power. Step-up transformers increase voltage, step-down transformers reduce voltage. Most power supplies use a step-down transformer to reduce the dangerously high voltage to a safer low voltage.

The input coil is called the primary and the output coil is called the secondary. There is no electrical connection between the two coils; instead they are linked by an alternating magnetic field created in the soft-iron core of the transformer. The two lines in the middle of the circuit symbol represent the core. Transformers waste very little power so the power out is (almost) equal to the power in. Note that as voltage is stepped down and current is stepped up.

The ratio of the number of turns on each coil, called the turn's ratio, determines the ratio of the voltages. A step-down transformer has a large number of turns on its primary (input) coil which is connected to the high voltage mains supply, and a small number of turns on its secondary (output) coil to give a low output voltage.

VOLTAGE REGULATOR (7805)

Features

- Output Current up to 1A.
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V.
- Thermal Overload Protection.
- Short Circuit Protection.
- Output Transistor Safe Operating Area Protection.

DESCRIPTION

The LM78XX/LM78XXA series of three-terminal positive regulators are available in the TO-220/D-PAK package and with several fixed output voltages, making them useful in a Wide range of applications. Each type employs internal current limiting, thermal shutdown and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output Current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

[Ratings of the voltage regulator]

2.3 IN4007 DIODES

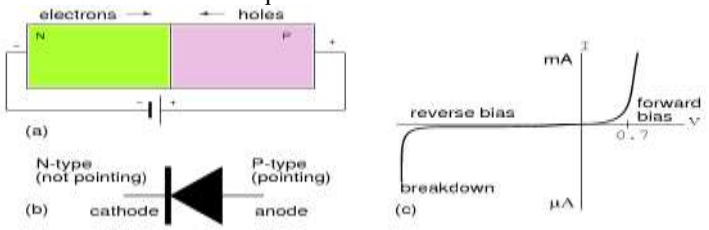
Diodes are used to convert AC into DC these are used as half wave rectifier or full wave rectifier. Three points must he kept in mind while using any type of diode.

Maximum forward current capacity

Maximum reverse voltage capacity

Maximum forward voltage capacity

Diode of same capacities can be used in place of one another. Besides this diode of more capacity can be used in place of diode of low capacity but diode of low capacity cannot be used in place of diode of high capacity. For example, in place of IN4002; IN4001 or IN4007 can be used but IN4001 or IN4002 cannot be used in place of IN4007.The diode BY125made by company BEL is equivalent of diode from IN4001 to IN4003. BY 126 is equivalent to diodes IN4004 to 4006 and BY 127 is equivalent to diode IN4007.

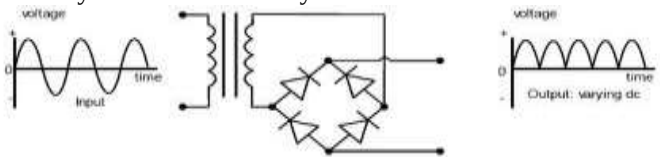


*[PN Junction **diode**]*

RECTIFIER

A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), current that flows in only one direction, a process known as rectification. Rectifiers have many uses in-

cluding as components of power supplies and as detectors of radio signals. Rectifiers may be made of solid state diodes, vacuum tube diodes, mercury arc valves, and other components. The output from the transformer is fed to the rectifier. It converts A.C. into pulsating D.C. The rectifier may be a half wave or a full wave rectifier. In this project, a bridge rectifier is used because of its merits like good stability and full wave rectification. In positive half cycle only two diodes(1 set of parallel diodes) will conduct, in negative half cycle remaining two diodes will conduct and they will conduct only in forward bias only.



Circuits of full bridge rectifier

FILTER

Capacitive filter is used in this project. It removes the ripples from the output of rectifier and smoothens the D.C. Output received from this filter is constant until the mains voltage and load is maintained constant. However, if either of the two is varied, D.C. voltage received at this point changes. Therefore a regulator is applied at the output stage.

The simple capacitor filter is the most basic type of power supply filter. The use of this filter is very limited. It is sometimes used on extremely high-voltage, low-current power supplies for cathode-ray and similar electron tubes that require very little load current from the supply. This filter is also used in circuits where the power-supply ripple frequency is not critical and can be relatively high. Below figure can show how the capacitor changes and discharges.

RELAYS

The relays are the final stage of this device which play a very prominent role to control the final appliances. The principle on that the relays work is electromagnetic force. When electricity starts flowing through a coil, it becomes an electromagnet. Steel plates are attracted by this electromagnetic coils get attracted, which is attached to a switch. So the switch's motion (ON or OFF) is controlled by current flowing through the coil, or not respectively.

A relay's very useful feature is that it can be used to isolate different parts of a circuit electrically. It allows a low voltage circuit (e.g. 5v DC) to switch the power in a high voltage circuit (e.g. 230v AC or more).

GSM Module

GSM module SIM900 is being used in the project here. It is just like a cell phone with all the facilities of sending and receiving a message, sending and receiving calls. It has a communication that can be programmed using AT commands. The signal names for the GSM modem communication port include the following; audio input and output pins (for connecting external hands free audio devices), mute control pin, flash programming signal pins, external power pins, and receiver and transmitter pins.

Here the RX and TX pins are used for the serial communication with the microcontroller. There are various AT commands to check the signal strength and connection and SIM status etc. Here the Hyper Terminal is used to initially interface with the computer to check the module. It also has an antenna to receive the GSM signal from the user's phone. The basic AT commands are loaded into the program of microcontroller for it to interface with the GSM module. The figure given below shows a GSM module**.**

GSM MODULE

Quad Band **GS**M/GPRS : 850 / 900 / 1800 / 1900 MHz
Built in RS232 to TTL or viceversa Logic Converter (MAX232)
Configurable Baud Rate
SMA (SubMiniature version A) connector with GSM L Type Antenna
Built in SIM (Subscriber Identity Module) Card holder
Built in Network Status LED
Inbuilt Powerful TCP / IP (Transfer Control Protocol / Internet Protocol) stack for internet data transfer through GPRS (General Packet Radio Service)
Audio Interface Connectors (Audio in and Audio out)
Most Status and Controlling pins are available
Normal Operation Temperature : -20 °C to +55 °C
Input Voltage : 5V to 12V DC
LDB9 connector (Serial Port) provided for easy interfacing

1 SIMComSIM900A GSM Module:

This is actual SIM900 GSM module which is manufactured by SIMCom. Designed for global market, SIM900 is a quad-band GSM/GPRS engine that works on frequencies GSM 850MHz, EGSM 900MHz, DCS 1800MHz and PCS 1900MHz. SIM900 features GPRS multi slot class 10/ class 8 (optional) and supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4. With a tiny configuration of 24mm x 24mm x 3mm, SIM900 can meet almost all the space requirements in User's applications, such as M2M, smart phone, PDA and other mobile devices supply through *AC/DC socket*. This is power supply designed into maximum protection consideration so that it can even prevent reverse polarity DC power supply as well as DC conversion from AC power Supply. It also includes *LM317 Voltage Regulator* which provides an output voltage adjustable over a1.2V to 37V.

SIM (SUBSCRIBER IDENTITY MODULE)

This onboard SIM card slot provide User functionality of insert a SIM (GSM only) card of any service provider. Process of inserting and locking SIM card into SIM card slot is given in this manual. While inserting in and removing out SIM card from SIM card slot, User needs to take precaution that power supply should be OFF so that after making Power supply ON it will be easy to reinitialize with SIM for this module.

RXD, TXD and GND pins (JP2)

These pins are used to connect devices which needs to be connected to GSM module through USART (Universal Synchronous Asynchronous Receiver and Transmitter) communication. Devices may be like Desktop or Laptop Computer System, Microcontrollers, etc. RXD (Receive Data) should be connected to TXD (Transmit Data) of other device and vice versa; whereas GND (Ground) should be connected to other device's GND pin to make ground common for both systems.

Design principle

There are two methods for designing power supply, the average value method and peak value method. In case of small power supply peak value method is quit economical, for a particular value of DC output the in put AC requirement is appreciably less. In this method the DC out put is approximately equal to V_m. A full wave bridge rectifier is designed using four diodes and the output of the rectifier is filtered with a capacitor. There are two capacitors connected in this power supply, one for filtering and providing back up to positive power supply and other one for providing backup and filter action to the negative power supply. The capacitor value is decided so that it will back up for the voltage and current during the discharging period of the DC output. In this case the out put with reference to the center tap of the transformer is taken in to consideration, though the rectifier designed is a full wave bridge rectifier but the voltage across the load is a half wave rectified out put. The Regulator section used here is configured with a series regulator LM78XX, the XX represents the output voltage and 78 series indicates the positive voltage regulator for power supply. The positive regulator works satisfactorily between the voltage XX+2 to 40 Volt DC. The output remains constant within this range of voltage. The output remains constant within this range of voltage.

Circuit connection

In this we are using Transformer (0-12) Vac/1Amp, IC 7805 & 7812, diodes IN 4007,LED & resistors.
Here 230V, 50 Hz ac signal is given as input to the primary of the transformer and the secondary of the transformer is given to the bridge rectification diode. The o/p of the diode is given as i/p to the IC regulator (7805 &7812) through capacitor (1000µF/35v). The o/p of the IC regulator is given to the LED through resistors.

Circuit Explanations

When ac signal is given to the primary of the transformer, due to the magnetic effect of the coil magnetic flux is induced in the coil (primary) and transfer to the secondary coil of the transformer due to the transformer action." Transformer is an electromechanical static device which transformer electrical energy from one coil to another without changing its frequency". Here the diodes are connected in a bridge fashion. The secondary
coil of the transformer is given to the bridge circuit for rectification purposes.
During the +ve cycle of the ac signal the diodes D2 & D4 conduct due to the forward bias of the diodes and diodes D1 & D3 does not conduct due to the reversed bias of the diodes. Similarly during the –ve cycle of the ac signal the diodes D1 & D3 conduct due to the forward bias of the diodes and the diodes D2 & D4 does not conduct due to reversed bias of the diodes. The output of the bridge rectifier is not a pure dc along with rippled ac is also present.

$$V_{DC} = 2Vm / \pi$$

or, $V_{DC} = (Vm – 2Vk)$
$= (12 – 1.4)$
$=10.6$
$\Rightarrow V_{DC} \times 2\sqrt{2}$
$= 19.1$Vdc.
$\cong$ 17Vdc.
To overcome this effect, a capacitor is connected to the o/p of the diodes (D2 & D3). Which removes the unwanted ac signal and thus a pure dc is obtained.
We knew, $Q = C \times V$

$\Rightarrow C = Q / V$
$= I \times t / V$
$= 1Amp \times 10msec / 17$
$= 588.2\mu F$
$\cong 1000\mu F$

Here we need a fixed voltage, that's for we are using IC regulators (7805 & 7812)."Voltage regulation is a circuit that supplies a constant voltage regardless of changes in load current." This IC's are designed as fixed voltage regulators and with adequate heat sinking can deliver output current in excess of 1A. The o/p of the bridge rectifier is given as input to the IC regulator through capacitor with respect to GND and thus a fixed o/p is obtained.

Vmax to 78XX = +35Vdc
Vmin to 78XX = 78XX + 2V
Imax = 1Amp DC.
short ckt protection
Thermal over load protection.

The o/p of the IC regulator (7805 & 7812) is given to the LED for indication purpose through a series resistor.

Imin to LED = 5mA
Imax to LED = 30mA

Then to find the value of series resistance by using the OHMs law,

$R_1 = V_1 / I$
$= 5/5mA = 1K\Omega.$
$\Rightarrow R_2 = V_2 / I$
$= 12 / 5mA = 2.4K\Omega.$
$\cong 2.2K\Omega.$

Due to the forward bias of the LED, the LED glows ON state, and the o/p are obtained from the pin no-3. Finally that is fed to the corresponding sub section as a Vcc with respect to GND.

Programs

Typically microcontroller programs must fit in the available on-chip program memory, since it would be costly to provide a system with external, expandable, memory. Compilers and assemblers are used to convert high-level language and assembler language codes into a compact machine code for storage in the microcontroller's memory. Depending on the device, the program memory may be permanent read only memory that can only be programmed at the factory, or program memory that may be field-alterable flash memory or erasable programmable read only memory.

Manufacturers have often produced special versions of their microcontrollers in order to help the hardware and software development of the target system. Originally these included EPROM versions that have a "window" on the top of the device through which program memory can be erased by ultraviolet light, ready for reprogramming after a programming ("burn") and test cycle. Since 1998, EPROM versions are rare and have been replaced by EEPROM and flash, which are easier to use (can be erased electronically) and cheaper to manufacture.

Other versions may be available where the ROM is accessed as an external device rather than as internal memory, however these are becoming increasingly rare due to the widespread availability of cheap microcontroller programmers.

The use of field-programmable devices on a microcontroller may allow field update of the firmware or permit late factory revisions to products that have been assembled but not yet shipped. Programmable memory also reduces the lead time required for deployment of a new product.

Where hundreds of thousands of identical devices are required, using parts programmed at the time of manufacture can be an economical option. These "mask programmed" parts have the program laid down in the same way as the logic of the chip, at the same time.

A customizable microcontroller incorporates a block of digital logic that can be personalized in order to provide additional processing capability, peripherals and interfaces that are adapted to the requirements of the application. For example, the AT91CAP from Atmel has a block of logic that can be customized during manufacture according to user requirements.

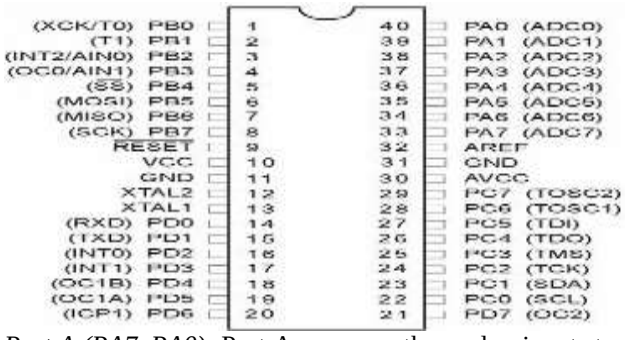
Higher integration Die of a PIC12C508 8-bit, fully static, EEPROM/EPROM/ROM-based CMOS microcontroller manufactured by Microchip Technology using a 1200 nanometre process.Die of a STM32F100C4T6B ARM Cortex-M3 microcontroller with 16 KB flash memory, 24 MHz Central Processing Unit (CPU), motor control and Consumer Electronics Control (CEC) functions. Manufactured by STMicroelectronics.

AT mega 16 Microcontroller

The high-performance, low-power Atmel 8-bit AVR RISC-based microcontroller combines 16KB of programmable flash memory, 1KB SRAM, 512B EEPROM, an 8-channel 10-bit A/D converter, and a JTAG interface for on-chip debugging. The device supports throughput of 16 MIPS at 16 MHz and operates between 4.5-5.5 volts**.**

By executing instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed.

PIN DESCRIPTION



Port A (PA7..PA0) Port A serves as the analog inputs to the A/D Converter. Port A also serves as an 8-bit bi-directional I/O port, if the A/D Converter is not used. Port pins can provide internal pull-up resistors (selected for each bit). The Port A output buffers have symmetrical drive characteristics with both high sink and source capability. When pins PA0 to PA7 are used as inputs and are externally pulled low, they will source current if the internal pull-up resistors are activated. The Port A pins are tri-stated when a reset condition becomes active, even if the clock is not running.

Port B (PB7..PB0) Port B is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port B output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port B pins that are externally pulled low will source current if the pull-up resistors are activated. The Port B pins are tri-stated when a reset condition becomes active, even if the clock is not running. Port B also serves the functions of various special features of the ATmega16 as listed

Port C (PC7..PC0) Port C is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port C output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port C pins that are externally pulled low will source current if the pull-up resistors are activated. The Port C pins are tri-stated when a reset condition becomes active, even if the clock is not running. If the JTAG interface is enabled, the pull-up resistors on pins PC5(TDI), PC3(TMS) and PC2(TCK) will be activated even if a reset occurs. Port C also serves the functions of the JTAG interface and other special features of the ATmega16.

Port D (PD7..PD0) Port D is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port D output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port D pins that are externally pulled low will source current if the pull-up resistors are activated. The Port D pins are tri-stated when a reset condition becomes active, even if the clock is not running. Port D also serves the functions of various special features of the ATmega16.

RESET Reset Input. A low level on this pin for longer than the minimum pulse length will generate a reset, even if the clock is not running.

XTAL1 Input to the inverting Oscillator amplifier and input to the internal clock operating circuit.

XTAL2 Output from the inverting Oscillator amplifier.

AVCC AVCC is the supply voltage pin for Port A and the A/D Converter. It should be externally connected to VCC, even if the ADC is not used. If the ADC is used, it should be connected to VCC through a low-pass filter.

AREF AREF is the analog reference pin for the A/D Converter**.**

Overview

The ATmega16 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega16 achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

The AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers.

The ATmega16 provides the following features: 16 Kbytes of In-System Programmable Flash Program memory with Read-While-Write capabilities, 512 bytes EEPROM, 1 Kbyte SRAM, 32 general purpose I/O lines, 32 general purpose working registers, a JTAG interface for Boundary scan, On-chip Debugging support and programming, three flexible Timer/Counters with compare modes, Internal and External Interrupts, a serial programmable USART, a byte oriented Two-wire Serial Interface, an 8-channel, 10-bit ADC with optional differential input stage with programmable gain (TQFP package only), a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and six software selectable power saving modes.

The Idle mode stops the CPU while allowing the USART, Two-wire interface, A/D Converter, SRAM, Timer/Counters, SPI port, and interrupt system to continue functioning. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next External Interrupt or Hardware Reset. In Power-save mode, the Asynchronous Timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. The ADC Noise Reduction mode stops the CPU and all I/O modules except Asynchronous Timer and ADC, to minimize switching noise during ADC conversions. In Standby mode, the crystal/resonator Oscillator is running while the rest of the device is sleeping. This allows very fast start-up combined with low-power con-

sumption**.** In Extended Standby mode, both the main Oscillator and the Asynchronous Timer continue to run. The device is manufactured using Atmel's high density nonvolatile memory technology. The On chip ISP Flash allows the program memory to be reprogrammed in-system through an SPI serial interface, by a conventional nonvolatile memory programmer, or by an On-chip Boot program running on the AVR core. The boot program can use any interface to download the application program in the Application Flash memory. Software in the Boot Flash section will continue to run while the Application Flash section is updated, providing true Read-While-Write operation. By combining an 8-bit RISC CPU with In-System Self-Programmable Flash on a monolithic chip, the Atmel ATmega16 is a powerful microcontroller that provides a highly-flexible and cost-effective solution to many embedded control applications. The ATmega16 AVR is supported with a full suite of program and system development tools including: C compilers, macro assemblers, program debugger/simulators, in-circuit emulators, and evaluation kits**.**

AVR studio

In this project we are using the AVR studio in which programming is done with the help of C language. AVR studio programming is used for digital input- output in C. Each AVR digital I/O port is associated with input output register and it is known as DDRx, PORTx registers where x represent the port A ,B, C….

Solution

The program below written in AVR Studio 4 accomplishes the task that was asked above. Here several rules should be following:

The header file <avr/io.h> must be included in order to use the name of the ports.

The port must be configure before they are used. The first two lines in the main() function of the program are for configuration.

Once the ports are configured the we can write or read from them.

The use of the "While(1)" loop allows for the continuous read and write operation.

```
#include<avr/io.h>
 int main(){
DDRB =0x00;     //configure portB as input
DDRB= 0xFF;    // configure portC as output
While (1){
PORTC=PINB;
}
Return0 ;
}
}
```

Here there are some other header files are used for running of each component used in the project model. They are given below:-

```
 # include<avr/io.h>                  // used for the name of the project
#include<util/delay.h>                 // used if any delay occurred in the program
# include<avr/adc.h>          // for converting analog to digital
```

When program writing is complete, then we burn the microcontroller by using Sinaprog Hex. Sinaprog is applicable when AVR studio software is used for coding of microcontroller.

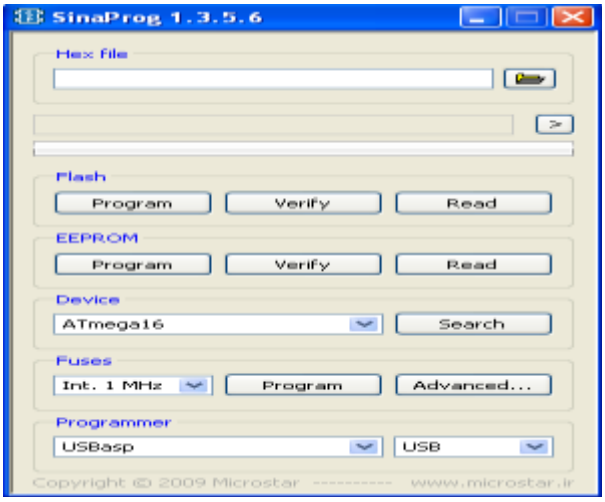
Programming or burning a microcontroller means to transfer the program from the compiler to the memory of the microcontroller. A compiler is a software which provides an environment to write, test and debug a program for the microcontroller. The program for a microcontroller is generally written in C or assembly language. Finally the compiler generates a hex file which contains the machine language instruction understandable by a microcontroller. It is the content of this hex file which is transferred to the memory of the microcontroller. Once a program is transferred or written in the memory of the microcontroller, it then works in accordance with the program**.**

SINAPROG

Steps for burning a microcontroller-

Step1:- First install the Sinaprog Hex.

Step2:-Open the Sinaprog Software.



Step3:- From the Hex File section browse the .hex file of the project you have Built.

Step4:- From Flash section click on Program button and wait for some time till it finishes programming. When it displays the message "Programming Flash OK" your controller is ready to work as per your program.

CIRCUIT DESIGN AND PROCEDURE

The block diagram of our project is shown below. It is an outline description of how we have implemented our project and the various steps involved in it. From the block diagram given below, the first mobile station is used as a transmitting section from which the user sends a SMS that contains instructions to the GSM mobile.

The GSM module transmits the message through serial communication to the microcontroller interfaced to it. Then the microcontroller processes the code and carries out the specific operations. The BC 547 transistor is used to drive the relay circuits which switches the different appliances connected to the interface.

After connecting the circuit properly and assuming all the connections are right the following steps are to be followed:

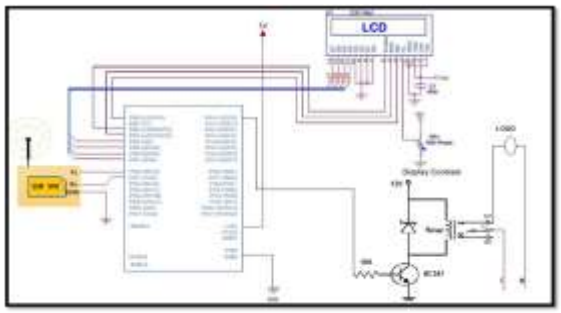
The remote user send an SMS ON/OFF to the GSM module.

Through the GSM network the signal is received by GSM module.

The GSM module transmits the message through serial communication to the microcontroller

Microcontroller issues commands to the appliances and the devices connecd will switch ON/OFF.

CIRCUIT DIAGRAM



LIMITATIONS

The proposed system only works in the places of good reception of signal and remote areas where there is no strong GSM signal, the equipment does not respond always

There should be always continuous power supplied to the equipment so that the microcontroller and phone connected to it works.

CONCLUSION

The project is aimed to design and implement a GSM based wireless control of house hold electrical appliances. After doing different tests and programming different codes, eventually the obliged outcome is put forward. It is a fast and efficient approach to control the devices. This equipment works anywhere. At last the obliged result is attained with GSM module Sim900 based outline for effective and compelling result.

In the minor of our project we are designed to control a single appliance with the help of GSM module. In major part we will design four appliances control device with feedback message system

REFERENCES

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