

Advanced Security System Using Bluetooth

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Abstract : *Security is a prime concern in our day to day life. Everyone wants to be as secure as possible and also want to keep their valuables very safe. Access control forms a very integral part of the system. Over here we have made a very unique kind of security system comprising of a Bluetooth based embedded hardware and an android based software.*

Keywords: *Bluetooth, ISM Band, Microcontroller, Personal Area Network [PSN], Security System, UHF Radio Wave*

I. Introduction

In today's concern security is the big issue. And mostly at the crowded places it becomes very difficult to maintain the security. In the corporate world, various aspects of security are historically addressed separately - notably by distinct and often non communicating departments for IT security, physical security, and fraud prevention. Today there is a greater recognition of the interconnected nature of security requirements, an approach variously known as holistic security, "all hazards" management, and other terms

Generally, the existing security systems are password based, remote control, RFID based which are known to everybody which can be easily detected. So there is needed to design the system that would work in hidden way. So this project aims on developing the system that would be operated and accessed silently. Bluetooth is wireless technology which is operated over the range of 10m and is most secured. Soto develop the advanced security system, Bluetooth technology can be used which it is operated in 2.4GHzISM band. So in this project the security system is accessed only when the Bluetooth of the valid user is paired with the Bluetooth module in security system, after this pairing authentication will get confirmed and the system would be finally accessed by the user by either entering the password or fingerprint. Then the system would get unlock. If any other person tries to access the system even if he knows the password the system would not get unlocked and it would give the alert by means of buzzer or hutter depending on the place where the system is installed.

II. Basic Principle

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs). Invented by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 20,000member companies in the areas of telecommunication, computing, networking, and consumer electronics. Bluetooth was standardized as IEEE 802.15.1 but the standard is no longer maintained. Bluetooth is a packet-based protocol with a master-slave structure. One master may communicate with up to seven slaves in a piconet all devices share the master's clock. Bluetooth uses a radio technology called frequency-hopping spread spectrum. The transmitted data are divided into packets and each packet is transmitted on one of the 79 designated Bluetooth channels. Each channel has a bandwidth of 1 MHz's Bluetooth 4.0 uses 2 MHz spacing which allows for 40 channels.

III. System Development

3.1 Block Diagram

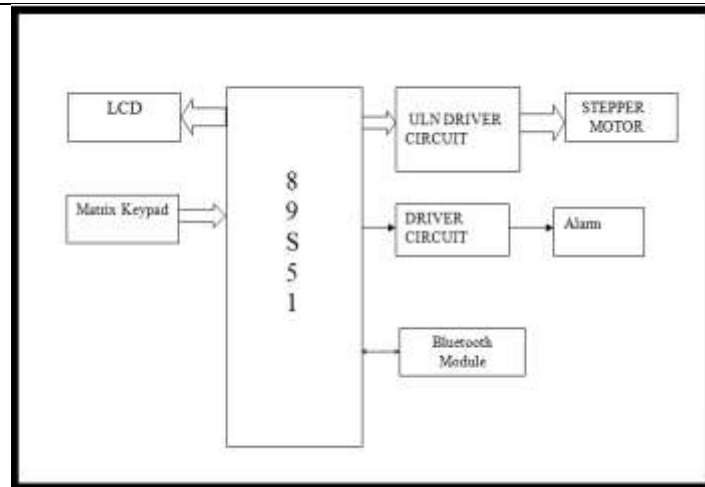


Fig 3.1 Block diagram

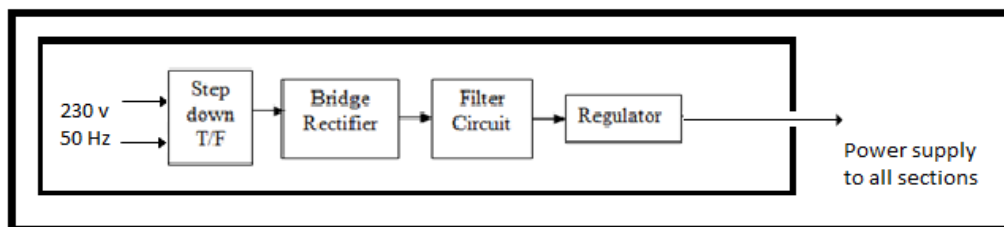


Fig3.2 -Block diagram of power supply

3.1 Matric Keypad

Matrix keypads are commonly used in applications where we have to take input from the user like a password, amount, set points, etc. Various sizes of matrix keypad are available in the market but we use are 4x3 matrix keypads. Matrix keypads are basically switches but there interfacing is to controller is not same as a typical switch.

3.2 Lcd

Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose. The most common type of LCD controller provides a simple interface between the controller & an LCD. These LCD's are very simple to interface with the controller as well as are cost effective. The most commonly used alphanumeric displays are 1x16 (Single Line & 16 characters), 2x16 (Double Line & 16 character per line) & 4x20 (four lines & Twenty characters per line). out of this we use 2x16 LCD display

3.3 Stepper Motor

A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates in discrete step increments when electrical command pulses are applied to it in the proper sequence. The motor's rotation has several direct relationships to these applied input pulses. The sequence of the applied pulses is directly related to the direction of motor shafts rotation. The speed of the motor shafts rotation is directly related to the frequency of the input pulses and the length of rotation is directly related to the number of input pulses applied.

3.4 Bluetooth Module (HC -05 Bluetooth Transceiver TTL)

The Bluetooth Module Breakout is the latest Bluetooth wireless serial cable! This version of the popular Bluetooth uses the HC-05/HC-06 module. These modems work as a serial (RX/TX) pipe. Any serial stream from 9600 to 115200bps can be passed seamlessly from your computer to your target. The remote unit can be powered from 3.3V up to 6V for easy battery attachment

3.5 Power Supply

The +5 volt power supply is based on the commercial 7805 voltage regulator IC. This IC contains all the circuitry needed to accept any input voltage from 8 to 18 volts and produce a steady +5 volt output, accurate

to within 5% (0.25 volt). It also contains current-limiting circuitry and thermal overload protection, so that the IC won't be damaged in case of excessive load current; it will reduce its output voltage instead. The advantage of a bridge rectifier is you don't need a centre tap on the secondary of the transformer. A further but significant advantage is that the ripple frequency at the output is twice the line frequency (i.e. 50Hz) and makes filtering somewhat easier

3.6 Microcontroller 89s52

The AT89S52 is low power high performance CMOS 8 bit microcontroller which has 8k of in system flash memory. The device is manufactured using ATMEL's high density non volatile memory technology and is compatible with the industry standard 80c51 instruction set and pin out. The on chip flash allows the program memory to be reprogrammed in system or by conventional non volatile memory programmer .by combining a versatile 8 bit CPU with in- system programmable flash on a monolithic chip. The ATMEL AT89S52 is powerful microcontroller which provides a high flexible and cost effective solution to many embedded applications.

3.7 Uln2803

The ULN2803A device is a high-voltage, high-current. The device consists of (Single Output) eight NPN Darlington pairs that feature high- The collector-current rating of each Darlington pair is 500 mA. The Darlington pairs may be connected in parallel for higher current Types of Logic capability Applications include relay drivers, hammer drivers, lamp drivers, display drivers (LED and gas discharge), line drivers, and logic buffers. The ULN2803A device has a 2.7-kΩ series base resistor for each Darlington pair for operation directly with TTL or 5-V CMOS devices.

IV. Result

Up till now We Have to design Microcontroller & CPU Circuit and we have to test all the components and Microcontroller. These results are shown in below.

Actual	Required Voltage	Obtained Voltage
	12 v	12.3 v
	5v	5.1 v

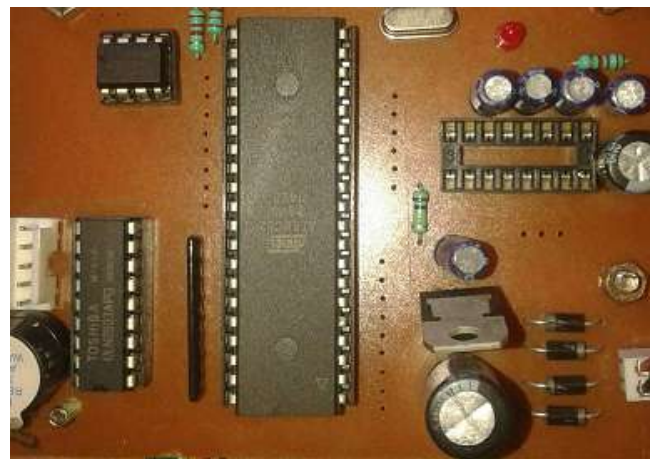


Fig 4.1.CPU Circuit

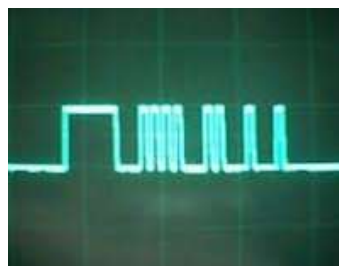


Fig 4.2.O/P Waveform of tested Microcontroller



Fig. 4.3. Bluetooth Module

V. Conclusion

Up till we have to complete Microcontroller CPU circuit and purchased Bluetooth module, remaining part including software is in progress. Over all 60% of project has been ready.

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