

PC based Security System

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ABSTRACT

This system involves design and construction of security system controlled through PC with several sensors and a controller attached in order to perform its specified tasks. In this project we can detect illegal person, who want to enter in house or industries. After detection automatically hooter (buzzer) , halogen lights will be turn on. The number of nearest police station will be dialed. The movement of that person in particular area can be captured using CCTV mounted on stepper motor. It is basically combination of sensors namely; IR sensor, LDR sensor, Magnetic sensor, Pressure sensor, Wire sensor giving input to the microcontroller. All the sensors are connected in parallel to the microcontroller so that we can add any new sensor easily. For this we used latest and most advanced 20pin microcontroller IC 89c2051 from MCS51 family

Keywords: IC 89c2051, Microcontroller, MCS51

1. INTRODUCTION

Everyone wants to be as much secure as possible. Knowing your home is protected provides peace of mind both when you are away and when you are home. Security is important even if you have outstanding public safety agencies (police, fire, highway patrol, etc.) in your area. There are far more homes than there are police officers, not to mention a plethora of skilled thieves. So we would like to implement our project to do everything possible to make your house secure rather than just relying on others. With the increasing busy schedules people rely on machines to support them in this modern world. It led to the need for intelligence to these machines in every area. Here the case is with home security. This paper involves an access control for doors and windows forming a vital link in a security chain implemented using two fully controlled 8 bit microcontrollers 8051. The Microcontroller based Home Security System can be adopted at Home, it has various types of Sensors.

The Microcontroller at the transmitter end will continuously monitors all the Sensors and if any security problem is found then the Microcontroller at the receiver end will switch on the Buzzer (Alarm) and the type of problem is displayed on the LCD. This equipment uses low power and operates in real time.

2. BLOCK DIAGRAM

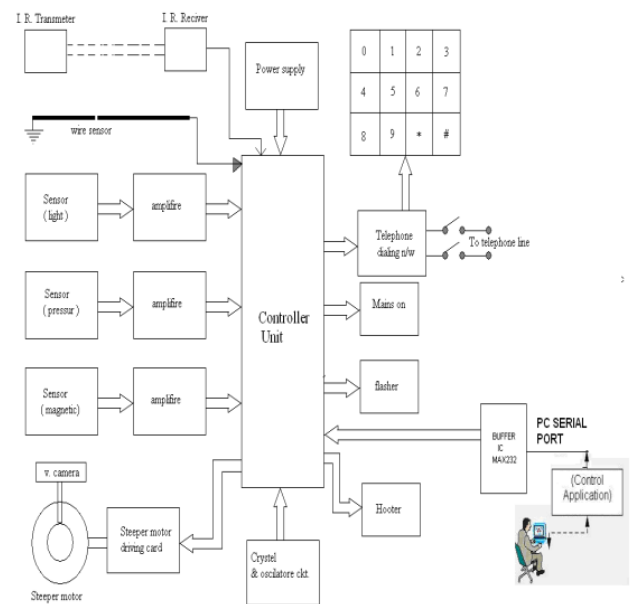


Figure 1. Block Diagram of the system

Figure shows basic block dig of project pc base security system. This system consists of following main block. 1)PC serial port 2)controller unit 3)Sensor a)I.R. transmitter & Receiver b)LDR c)Magnetic sensor d)Pressure sensor3)O/p devices a)relay b)Buzzer(Hooter),c) flasher.d) Auto phone dialer circuit. e) Steeper motor 4) Crystal & reset Circuit 5) Regulated power supply. we use pc serial port ,control command is place through pc by using software VB,serial port is connected to level shifter circuit IC MAX232 IC through directly interface to pc by TXD,RXD pin to controller IC.

2.1 Level Shifter and buffer circuit

Level Shifter and Buffer circuit are use to provide isolation and impedance matching between pc serial port and our project, for our project we use max232 IC circuit is use.

2.2 Controller unit

This system used latest and most advance 20pin microcontroller IC 89c2051 from MCS51 family the selection of micro controller is based on following main advantages.

- 1) Internal 2K electrically erasable programmable read only memory (EFROM).
- 2) Internal 128 byte of RAM.
- 3) Two 8 bit selectable I/P, O/P port P3 & P1.
- 4) Two 16 bit timer, counter for internal timing operation.
- 5) Two external and four internal interrupt source.
- 6) Internal clock oscillator CKT.
- 7) Instruction set fully compatible with industrial standard MCS51 family.

All sensor output are connected to port P1 & o/p devices i.e. relay, buzzer, flasher, auto redial network are connected to port P3. The software req. for system is feed in 2K EFROM of IC 89c2051 using flash FEPROM programmer. The program is in assembly language from and it is computable with 8051 instruction set.

2.3 Sensor

(a) I.R. transmitter Receiver: -

Infra red beam are invisible and operated at 36Khz freq. in infrared transmitter section uses IC 555 as a stable oscillator mode to generate 36khz beam of I.C. and I.R. receiver which is place away from transmitter can sense this beam the receiver has 3 pin +VCC, o/p & GND when I.R. beam is falls on receiver it o/p becomes logically Zero. This I.R. pair place near national boundary when any one terrorist try to enter the I.R. beam is cut and o/p of receiver goes high this low to High transition detected by micro controller and o/p devices goes on.

(b) LDR: -

The light dependant resistance LDR are use to detect if any one terrarium try cross border at night he turn on his battery at night The light of this battery falls on LDR and he detected. In normal position setting of LDR o/p is such that voltage is logically zero position at day, when light falls on LDR o/p changes from low to high and it detected by micro controller.

(c) Magnetic sensor:-

These ABS-molded, elegant magnetic sensors are easy to install. These sensors prevent any type of magnetic field generated due to plan, which is fly above border. The two parts are to be fixed facing each other in close proximity. If the gap exceeds 18 mm due to opening of the doors, the sensor transmits the signal to the process control unit for an alarm. This robust sensor is best suited for heavy duty applications where the gap allowable is up to 75 mm.

(d) Pressure Sensor :-

This pressure mat sensor is designed for under border ground use and is perfect for providing reliable protection in difficult coverage areas. The false alarm due to intruding animals are carefully avoided by its higher-weight-tolerance design. This

can be cut in exact lengths to conceal under the border ground.

2.4 O/P devices

a) Auto phone dialing Circuit: -

When-ever any one sensor o/p goes low it is detected by micro controller give pulse of high to low transient to auto redial IC (2560). In this IC we feed telephone no of military camp by using telephone keypad and setting Auto Normal switch set Auto mode. When micro controller give pulse to this CKT it redial no. (which is feed previously) to telephone line and using telephone answering machine we can give any message so that there is arrival of terrarium on border

b) Video camera:-

Video camera is mounted on steeper motor when terrarium is detected this camera is on and steeper motor rotated slowly from left to right in half circle so that video camera scan completely area and record picture on V.C.R. When terrarium try to enter in nation border it is detected by sensor and to aware about it o/p devices i.e. Hotter or (buzzer) for sound indication, relay to ON light so military man know that terrorist enter in our border is Automatically dial and message using telephone answering m/c is send to it.

2.5 Crystal and reset circuit

When power is turn on the program execution is internal EEPROM of Microcontroller may start from starting memory location 000H for this purpose RC CKT at pin 1 is connected which is pulls at power on at pin RST of micro controller for internal operation of micro controller we need machine cycle for this purpose we connected 12Mhz crystal between pin XTAL1 (4) & XTAL2 (5) of 89c2051.

2.6 Regulated power supply

For our project we need regulated power supply of +5v for this purpose we use step down transformer, full wave rectifier, filter and voltage regulated IC 7805 more details about power supply is given in farther chapter of design of regulated power supply.

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3. WORKING

In this System we can monitoring and control by pc with serial communication of PC and controller, RS232 serial cable is used. But serial port of pc is not directly compatible with TTL pins i.e. TXD and RXD of pins of pc. Therefore it requires a line driver i.e. level shifter MAX232 chip to boost TTL level into +12V & -12V voltage level and vice versa. The interfacing between pc with controller with MAX232

serial communication IC is shown in the figure. The trans-receiver has two pins that are used for transferring and receiving data serially. These two pins are called as TXD and RXD pin respectively. These pins are TTL compatible so it requires a line driver to make them RS232 compatible & vice versa.

The MAX232 consist of two sets of line drivers for transferring and receiving data. The line drivers used for TXD are called as T_{1IN} and T_{2OUT} while line drivers for RXD are called as R_{1IN} and R_{2OUT} . In this MAX232 IC only one line driver is used.

As shown in figure T_{1IN} and R_{1OUT} of line driver MAX232 are connected to TXD and RXD of controller.

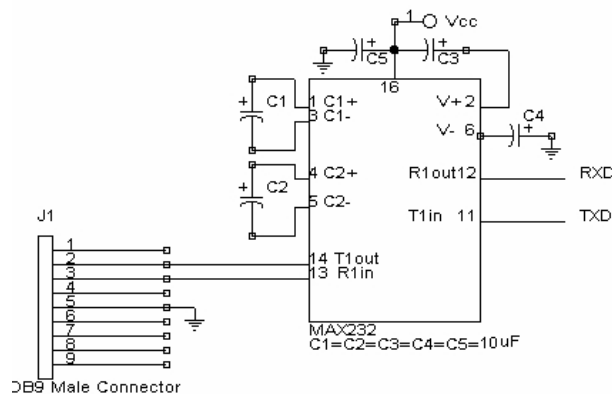


Figure.2 Circuit diagram

When any one illegal person enter in our room then magnetic sensor detect the electro-magnetic field and its position change so pin p1.1 is become logically one which is detected by software instruction in program.

When illegal person enter the room then person weight pressure fall on pressure switch and it will press and p1.2 is connected to ground and detected by software instruction.

In normal situation I.R. (36kHz freq.) invisible beam falls on I.R. receiver so its output becomes logically zero i.e. p3.2 is zero when any one illgal (person) at night try to comes from crossing border then I.R. beam is cut by this person and output of I.R. receiver becomes logically 1.

When any one illegal person to be turn ON torch or light falls on LDR. So it resistance becomes increases and voltage is drop at point pin p3.3, so at point p3.3 we get logically '1' which is again detected by micro controller by software instruction.

After detection of illegal person this system track following action automatically

1. Turn on video camera and record movement of illegal person through it and move steeper motor, so that video camera detects total area.
2. Turn on halogen lights for clear identification of illegal person.

3. Turn on hooter (buzzer) for audio indication.
4. Auto redial to nearest police station and give message about some illegal person theft is detect.

When there is detection of illegal person, motor move in clockwise & anticlockwise direction and move Video camera mounted over it .

Another indication is Hooter(buzzer), which sound loudly when theft is deleted by so that police men's can hear this sound and catch the theft. When any one sensor output changes know about it through software instruction and Jump programme ON warn subroutine so that Buzzer is turn ON , Turn ON halogen (bulb) light through relay . Similarly give pulse to auto phone redial IC 2560 to redial police station no in RAM of IC 2560 after every minute.

5. ADVANTAGES

As we use pc with controller for interfacing system is more flexible due to use of programming.

Number of action after detecting illegal person is so strong such as auto phone dialing, Video camera recording, Hooter or siren indication, so illegal person is totally trap.

Whole system is work on only +5v and +12 volt D.C. supply so it required less power consumption.

To increase number of sensor is so easy as they are connected in parallel with present sensor.

We easily add new sensor to our project.

Dialing number can easily change using key pad.

We provide sensor on switch to turn on the system to avoid handling by wrong person.

6. CONCLUSION

As security is prime concern nowadays this system will serve best for the security. It can be implemented for security purpose including homes , banks and border etc. It would serve best if used with advance technologies by paying out some extra money. The microcontroller based security system consist sections as transmitter, receiver, phase locked loop and processing section. The transmitter continuously transmits IR rays which are received by the receiver section. The received signal is again amplified for PLL section and then given to the PLL section, where its frequency is locked to the transmitted frequency.Variable resistor VR2 is used for tuning IC3 to the desired center frequency in the 6-10 kHz range,Which should match the modulating frequency of the transmitter. Capacitor C6 and C7 are used as low pass filter.when the received signal is locked to frequency of transmitter signal pin 8 of IC3 goes low and LED 1 glows. Since pin 8 is connected to the base of transistor T4 through R13 its collector voltage rises. As a result T5 is forward biased, the relay RL5 the pole and

normally in closed contact of really contact of RL5 are connected to +5v. When the IR signal is interrupted, the microcontroller starts working according to the program burnt into the EPROM .

7. REFERENCES

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