# MOBILE PHONE SECURITY SYSTEM

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Abstract: This paper presents a security system which permits the notification through mobile phone for some breach of close produced in any area supervised by the sensors and the operating from a distance, through mobile phone too, of any section of the warning block in order to discourage and reprisal the intruder.

Keywords: mobile phone, muvement sensor, intruder, microcontroller, programme, SIM card.

## 1. INTRODUCTION

A system of modern supervision must have the capacity to detect, discourage and prevent or delay any attempt of penetrating the protected objectives or zones and to accumulate material concerning this event.

The system presented in this work carries out all the above mentioned conditions with the observation that the function of realizing a documentary material is deficient in the absence of a video system even if it can memorize the chronological order and the exact moment of attacking the supervised points by the intruder.

However, this disadvantage can be easily surpassed by coupling this system with the *Webcam security system* [see ref.].

## 2. THE BLOCK SCHEME

The security system presented in fig. 1 is made up of the central unit, the input block, the output block, the detection system for the intruder, the warning block, the serial interface, the distance information transmitting block and the supply block.

### *2.1. The central unit*

The central unit is made up of the microcontroller AT89C52, the peripherical selection block GAL22V10, the parallel input port on 8 bits MM74HCT541, the parallel output port on 8 bits MM74HCT574, the supervised circuit of the microcontroller ADM 691, the ROM serial memory and the configuration switch with 8 channels.

### *2.2. The input and output blocks*

The input and output blocks, shown in fig. 2 and 3, are formed by the integrated optocouplors LTV844 and they have the role to realize the galvanic isolation between the central unit, on one hand and the sensors, respectively the sections of the warning block on the other hand

In fig. 4 and 5 a detail for each of the two blocks is presented.

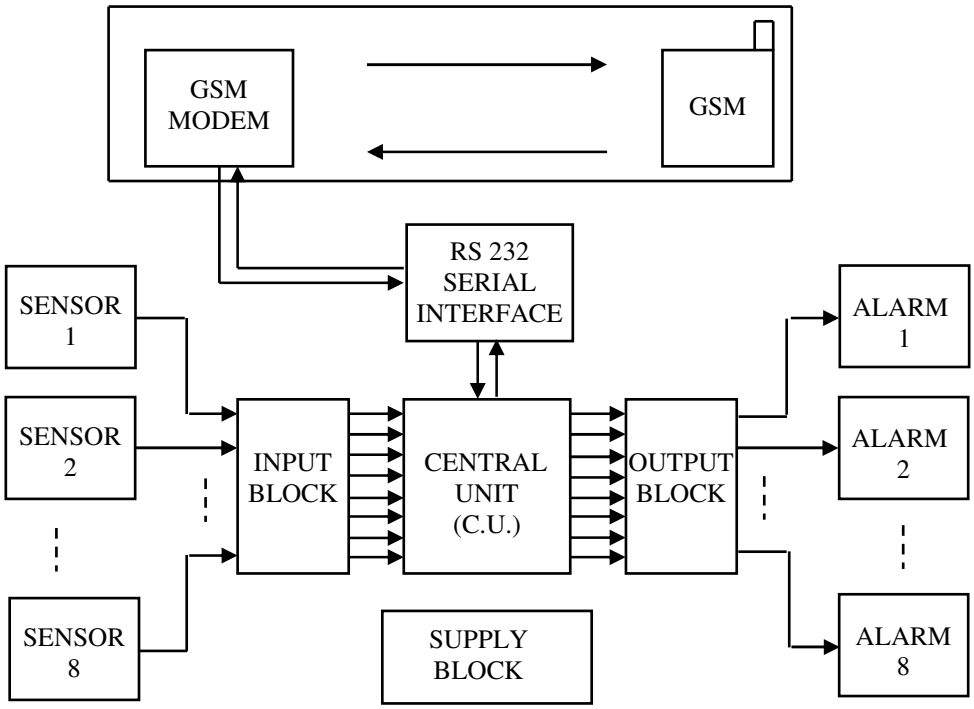


Fig. 1. Block scheme

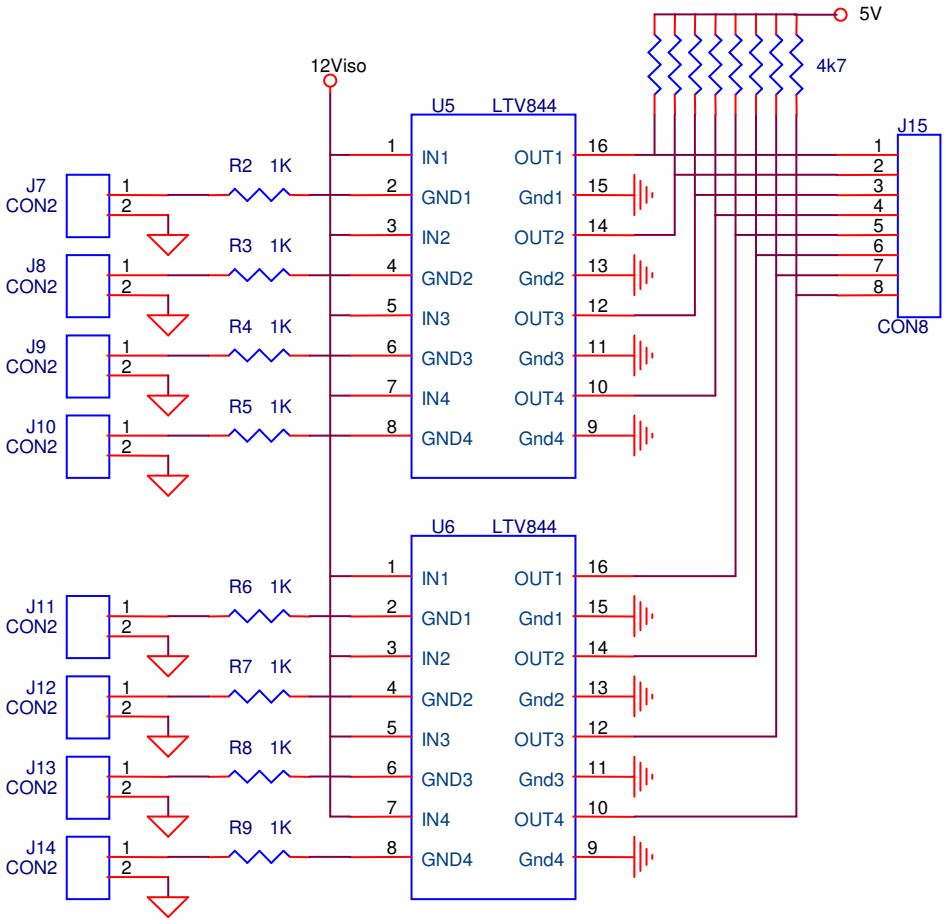


Fig. 2. The input block

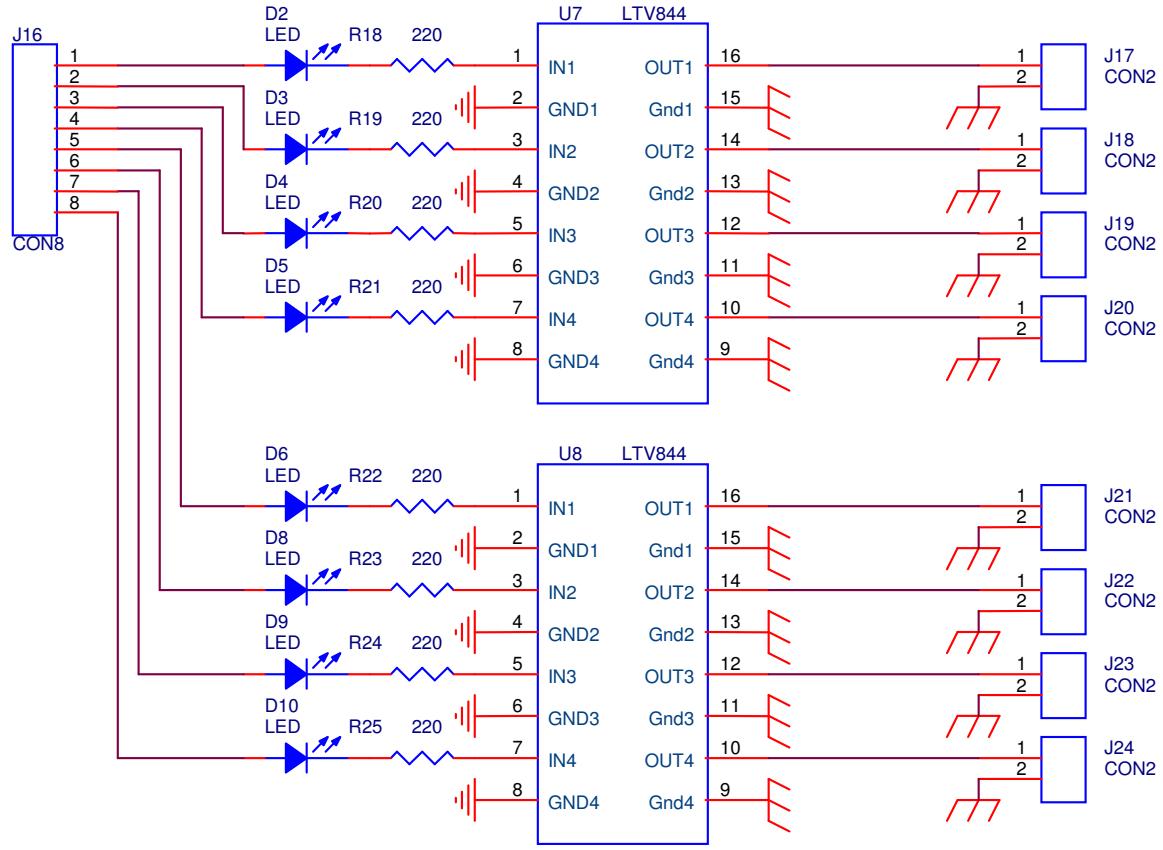


Fig. 3. The output block

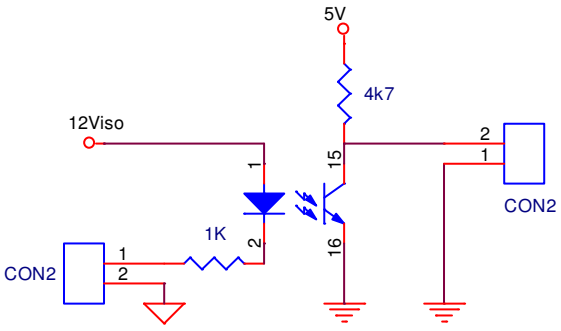


Fig. 4. A detail of the input block

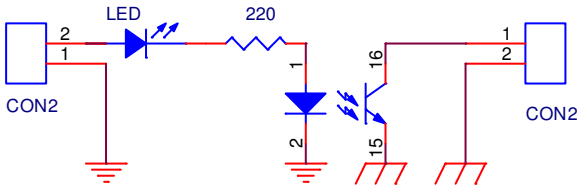


Fig. 5. A detail of the output block

*2.3. The intruder detection block*

The intruder detection block is made up of eight movement sensors or any type of sensors on condition that these could give the 0 output logical level when they are activated.

*2.4. The warning block*

The warning block is formed by eight sections which, when they are activated, can generate acustic and light signals, can shut off doors, start engines, flood spaces, a.s.o.

*2.5. The serial interface*

The serial interface RS232 permits a baudrate up to 200KB/s and realizes the bidirectional link with the GSM modem.

*2.6. The distance information transmitting block*

The distance information transmitting block is made up of a GSM modem from Telit GM682-PCS/_GPRS/_GSM family, endowed with a SIM card and a mobile phone.

The transmission between the two modules takes place through some bidirectional SMS-s.

*2.7. The supply block*

The supply block has three stabilized voltage sources, two of 12V and one of 5V, realized with the three terminal integrated circuits LM7812 and LM7805.

## 3. THE MICROCONTROLLER PROGRAMMING

The modem initialization routine, fig. 6, contains the following controls:

1. AT <cr> - modem activation
   OK is waited for.
2. AT + IPR = 9600- baudrate selection
   OK is waited for.
3. AT + CMEE = 1 – error message activation
   OK is waited for.
4. AT + CMGF = 1 <cr> - "text" type selection for SMS-s
   OK is waited for.
5. AT + CMGS = "user's phone number " – send SMS.
   The prompter ">" is waited for, after which the SMS is written.

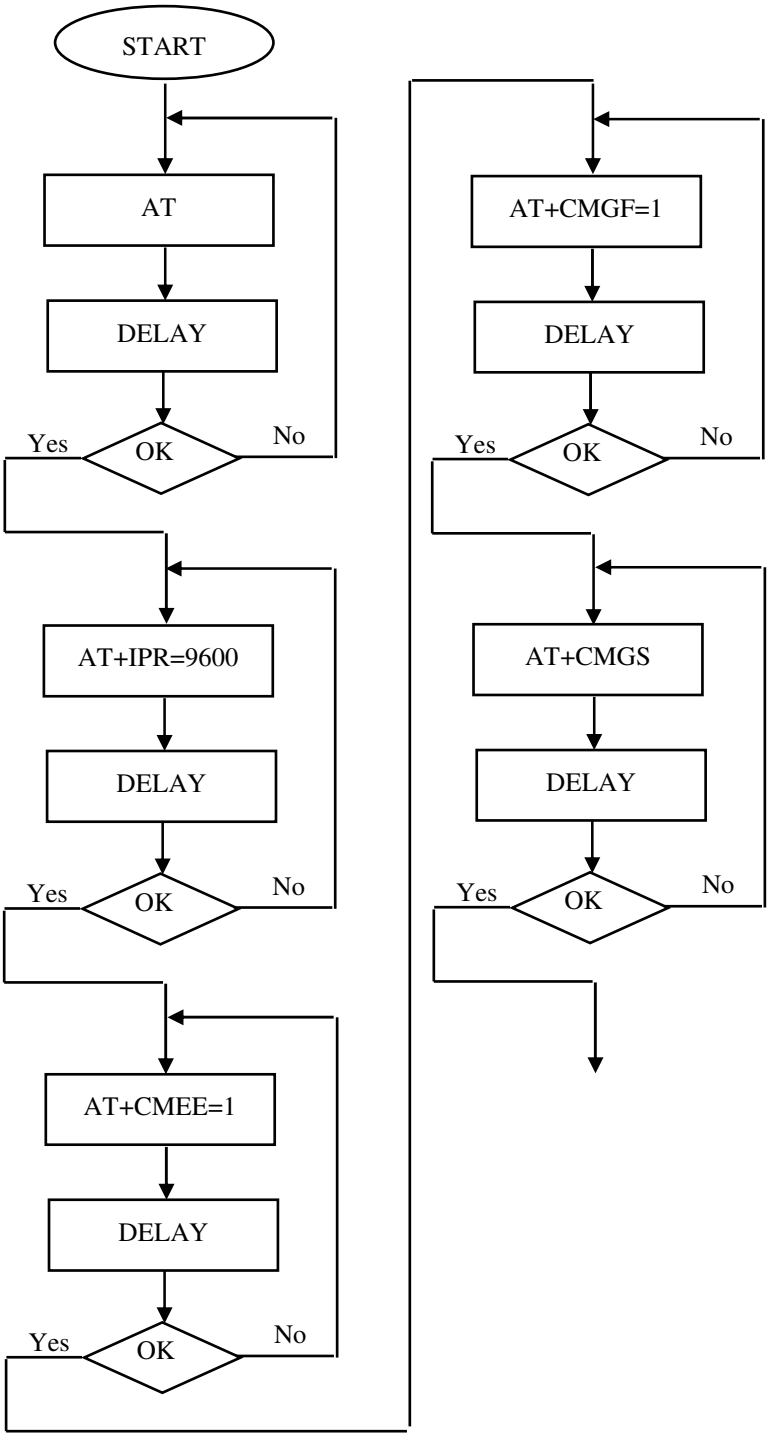


Fig. 6. The logical scheme of the modem initialization routine

Finally, it is sent the CTRL – Z and
the message is waited for AT + CMGS :
<the number of the message> OK

If after any of the AT controls it is not confirmed the correct receiving of the control, this one is repeated.

The programme is written in $C^{++}$ and it is next presented:

```
#include <stdio.h>
#include <AT89X52.h>
#include <absacc.h>
#include <string.h>
#include <ctype.h>

unsigned char rst,k,ki,modem_ok,lf,cr,kk;
unsigned long i;

char TX_buffer[42];
char long_buffer[42];
unsigned char intrari;

// RESET ROUTINE

void resetuc(void) interrupt 1
{
        XBYTE[0x70] = 0;
}
//  INTERRUPTION UART  ROUTINE

void serial receiving (void) interrupt 4
{
        if (RI)
        {
                if (ki<42)
                {long_buffer[ki] = SBUF;
                ki++;
                RI = 0;}
        }
}
// MODEM GSM ROUTINE

void send_cmd(void)
{
//strcpy(long_buffer,TX_buffer);
for (k=0;k<43;k++) long_buffer[k] = 0;
ki = 0;
k = strlen(TX_buffer);
TX_buffer[k]=13;
//TX_buffer[k+1]=10;
TI = 0;
for (k=0;k<strlen(TX_buffer);k++)
{
        SBUF = TX_buffer[k];
        while (!TI){};
        TI = 0;
        for (i=0;i<500;i++);
}
for (i=0;i<150000;i++);
if (long_buffer[2]=='O'&
        &long_buffer[3]=='K') modem_ok = 1;
}
void init_modem(void)
{
XBYTE[0x40] = 0x01;
modem_ok = 0;
while(!modem_ok)
{
        for (k=0;k<43;k++) TX_buffer[k] = 0;
        strcpy(TX_buffer,"AT");
        send_cmd();
}
XBYTE[0x40] = 0x02;
modem_ok = 0;
while(!modem_ok)
{
        for (k=0;k<43;k++) TX_buffer[k] = 0;
        strcpy(TX_buffer,"AT+IPR=19200");
        send_cmd();
}
XBYTE[0x40] = 0x04;
modem_ok = 0;
while(!modem_ok)
{
        for (k=0;k<43;k++) TX_buffer[k] = 0;
        strcpy(TX_buffer,"AT+CMEE=1");
        send_cmd();
}
XBYTE[0x40] = 0x08;
modem_ok = 0;
while(!modem_ok)
{
        for (k=0;k<43;k++) TX_buffer[k] = 0;
        strcpy(TX_buffer,"AT+CMGF=1");
        send_cmd();
}
modem_ok=0;
XBYTE[0x40] = 0x10;
while(!modem_ok)
{
        for (k=0;k<43;k++) TX_buffer[k] = 0;
        strcpy(TX_buffer,"AT+CMGS=");
        TX_buffer[strlen(TX_buffer)]="";
        strcat(TX_buffer,"0723492338");
        TX_buffer[strlen(TX_buffer)]="";
        send_cmd();
        for (i=0;i<150000;i++);
        for (k=0;k<43;k++) TX_buffer[k] = 0;
        strcpy(TX_buffer,"MODEM INIT.");
        send_cmd();
}
XBYTE[0x40] = 0x1F;
for (i=0;i<150000;i++);
modem_ok = 0;
}
void send_sms_inputs(void)
{
while(!modem_ok)
{
      XBYTE[0x40]=0x10;
      for (k=0;k<43;k++) TX_buffer[k] = 0;
      strcpy(TX_buffer,"AT+CMGS=");
```

```
        TX_buffer[strlen(TX_buffer)]='"';
        strcat(TX_buffer,"0723492338");
        TX_buffer[strlen(TX_buffer)]='"';
        send_cmd();
        for (i=0;i<150000;i++);
        for (k=0;k<43;k++) TX_buffer[k] = 0;
        if (inputs&0x01) strcat(TX_buffer,"I0=1\n");
                else strcat(TX_buffer,"I0=0\n");
        if (inputs&0x02) strcat(TX_buffer,"I1=1\n");
                else strcat(TX_buffer,"I1=0\n");
        if (inputs&0x04) strcat(TX_buffer,"I2=1\n");
                else strcat(TX_buffer,"I2=0\n");
        if (inputs&0x08) strcat(TX_buffer,"I3=1\n");
                else strcat(TX_buffer,"I3=0\n");
        if (inputs&0x10) strcat(TX_buffer,"I4=1\n");
                else strcat(TX_buffer,"I4=0\n");
        if (inputs&0x20) strcat(TX_buffer,"I5=1\n");
                else strcat(TX_buffer,"I5=0\n");
        if (inputs&0x40) strcat(TX_buffer,"I6=1\n");
                else strcat(TX_buffer,"I6=0\n");
        if (inputs&0x80) strcat(TX_buffer,"I7=1\n");
                else strcat(TX_buffer,"I7=0\n");
        send_cmd();
XBYTE[0x40]=0x1F;
                for (i=0;i<150000;i++);
}
modem_ok = 0;
}

void main(void)
{
XBYTE[0x40] = XBYTE[0x40];
//lcd_present = 0;
//serial setting
rst=PCON;
rst|=0x80;
PCON=rst;
TMOD&=0x0f;
TMOD|=0x20;
TH1=0xfd;//=0xff;
TR1=01;
SCON=0x50;
TMOD &= 0xF0;
TMOD |= 0x01;
TR0 = 1;
ET0 = 1;
//END
RI = 0;
TI = 0;
ES = 1;
EA = 1;
Modem init.();
for (k=0;k<43;k++)
        long_buffer[k] = 0;
ki = 0;
while(1)
{
        inputs = XBYTE[0x40];
        XBYTE[0x40] = 0;
        if (inputs != 255) send_sms_inputs();
}
}
```

## 4. CONCLUSIONS

The presented system is an attempt to use the mobile phone in industrial field.

The transition from this security system to any other type of system with distance supervision and control, represents a minor application.

## REFERENCES


Filipescu, V.F., (2002), *Circuite electronice digitale*, Ed. Universitaria, Craiova;

Filipescu, V.F., Gheorghiu, F.C., (2005), *Webcam security system*, The International Symposium on System Theory, Automation, Robotics, Computers, Informatics, Electronics and Instrumentation, SINTES 12, 20-22 October, Craiova, Romania;

Melnic, V., (1999), *Sisteme electronice de supraveghere*, Ed. Teora, Bucuresti;

Negrescu, L., (1997), *Limbajul C*$^{++}$ , vol. II, editia a III-a, Ed. Albastra, Cluj-Napoca.