

### III. Código del programa.

#### PROGRAMA PRINCIPAL

```
#include <18F2520.h>
#fuses XT,NOPUT,NOPROTECT,NOBROWNOUT,NOLVP,NOWDT,NOPBADEN

#use delay(clock=4000000)
#use i2c(MASTER, SDA=PIN_C4, SCL=PIN_C3)
#use RS232(BAUD=9600,BITS=8,PARITY=N,XMIT=PIN_C6,RCV=PIN_C7)
#use standard_io(b)
#use standard_io(c)

int num[6];
int menu=0;
char tele[9];
int teclado=1;
char ctrlz=26;
int bloq=0;
int gsmstatus=0;
int keycount=0;
int inicio;
int menuindex;
int intento=0;
int numintento;
int permiso=1;
char key;

#define LCD_ENABLE_PIN PIN_A2
#define LCD_RS_PIN PIN_A0
#define LCD_RW_PIN PIN_A1
#define LCD_DATA4 PIN_C0
#define LCD_DATA5 PIN_C1
#define LCD_DATA6 PIN_C2
#define LCD_DATA7 PIN_C5

#include <lcd.c>

void kbd_init(){
set_tris_b(0xF0);
port_b_pullups(FALSE);}

int cambioint(){
int numer;
if (key=='0'){
numer=0;}

if (key=='1'){
numer=1;}

if (key=='2'){
```

```
    numer=2;}

    if (key=='3'){
    numer=3;}

    if (key=='4'){
    numer=4;}

    if (key=='5'){
    numer=5;}

    if (key=='6'){
    numer=6;}

    if (key=='7'){
    numer=7;}

    if (key=='8'){
    numer=8;}

    if (key=='9'){
    numer=9;}

    if (key=='A'){
    numer=10;}

    if (key=='B'){
    numer=11;}

    if (key=='C'){
    numer=12;}

    if (key=='D'){
    numer=13;}

    if (key=='*'){
    numer=14;}

    if (key=='#'){
    numer=15;}

    return numer;
}

char kbd_getc()
{
    char kbdc;
    kbdc='G';

    output_high(PIN_B0);
    output_low(PIN_B1);
    output_low(PIN_B2);
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output_low(PIN_B3);
if (input_state(PIN_B4)==1 && teclado==1){
kbdc='1';
teclado=0;
}

else if (input_state(PIN_B5)==1 && teclado==1){
kbdc='2';
teclado=0;
}

else if (input_state(PIN_B6)==1 && teclado==1){
kbdc='3';
teclado=0;
}

else if (input_state(PIN_B7)==1 && teclado==1){
kbdc='A';
teclado=0;
}

output_low(PIN_B0);
output_high(PIN_B1);
output_low(PIN_B2);
output_low(PIN_B3);

if (input_state(PIN_B4)==1 && teclado==1){
kbdc='4';
teclado=0;
}

else if (input_state(PIN_B5)==1 && teclado==1){
kbdc='5';
teclado=0;
}

else if (input_state(PIN_B6)==1 && teclado==1){
kbdc='6';
teclado=0;
}

else if (input_state(PIN_B7)==1 && teclado==1){
kbdc='B';
teclado=0;
}

output_low(PIN_B0);
output_low(PIN_B1);
output_high(PIN_B2);
output_low(PIN_B3);

if (input_state(PIN_B4)==1 && teclado==1){

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```

kbdc='7';
teclado=0;
}

else if (input_state(PIN_B5)==1 && teclado==1){
kbdc='8';
teclado=0;
}

else if (input_state(PIN_B6)==1 && teclado==1){
kbdc='9';
teclado=0;
}

else if (input_state(PIN_B7)==1 && teclado==1){
kbdc='C';
teclado=0;
}

output_low(PIN_B0);
output_low(PIN_B1);
output_low(PIN_B2);
output_high(PIN_B3);

if (input_state(PIN_B4)==1 && teclado==1){
kbdc='*';
teclado=0;
}

else if (input_state(PIN_B5)==1 && teclado==1){
kbdc='0';
teclado=0;
}

else if (input_state(PIN_B6)==1 && teclado==1){
kbdc='#';
teclado=0;
}

else if (input_state(PIN_B7)==1 && teclado==1){
kbdc='D';
teclado=0;
}

output_low(PIN_B3);
output_high(PIN_B0);
output_high(PIN_B1);
output_high(PIN_B2);
output_high(PIN_B3);

if (input_state(PIN_B4)==0 && input_state(PIN_B5)==0 && input_state(PIN_B6)==0 &&
input_state(PIN_B7)==0){

```

```

    teclado=1;
}

output_low(PIN_B0);
output_low(PIN_B1);
output_low(PIN_B2);
output_low(PIN_B3);

return kbdc;
}

void smstomobile(){
printf("AT+CMGF=1\r");
delay_ms(500);

if (gsmstatus==1){
printf("AT+CMGS="+34%c%c%c%c%c%c%c%c%c%c
%c",tele[0],tele[1],tele[2],tele[3],tele[4],tele[5],tele[6],tele[7],tele[8]);
delay_ms(500);
printf("Caja abierta por usuario");
delay_ms(500);
printf("%c",ctrlz);
delay_ms(500);
gsmstatus=0;
}

if (gsmstatus==2){
printf("AT+CMGS="+34%c%c%c%c%c%c%c%c%c%c
%c",tele[0],tele[1],tele[2],tele[3],tele[4],tele[5],tele[6],tele[7],tele[8]);
delay_ms(500);
printf("Caja bloqueada");
delay_ms(500);
printf("%c",ctrlz);
delay_ms(500);
gsmstatus=0;
}

if (gsmstatus==3){
printf("AT+CMGS="+34%c%c%c%c%c%c%c%c%c%c
%c",tele[0],tele[1],tele[2],tele[3],tele[4],tele[5],tele[6],tele[7],tele[8]);
delay_ms(500);
printf("Intento gastado");
delay_ms(500);
printf("%c",ctrlz);
delay_ms(500);
gsmstatus=0;
}

if (gsmstatus==4){
printf("AT+CMGS="+34%c%c%c%c%c%c%c%c%c%c
%c",tele[0],tele[1],tele[2],tele[3],tele[4],tele[5],tele[6],tele[7],tele[8]);
delay_ms(500);

```

```

printf("Alarma de panico");
delay_ms(500);
printf("%c",ctrlz);
delay_ms(500);
gsmstatus=0;
}

}

//=====I2C para número
void telefono(){
keycount=1;
lcd_putc("\f");
lcd_putc("Teclea numero");
lcd_gotoxy(1,2);
while(keycount<10)
{
key = kbd_getc();
if(key!='G' && key<='9' && keycount==1){
tele[0]=cambioint();
printf(lcd_putc,"%c",key);
key='G';
keycount++;}
if(key!='G' && key<'A' && keycount==2){
tele[1]=cambioint();
printf(lcd_putc,"%c",key);
key='G';
keycount++;}
if(key!='G' && key<'A' && keycount==3){
tele[2]=cambioint();
printf(lcd_putc,"%c",key);
key='G';
keycount++;}
if(key!='G' && key<'A' && keycount==4){
tele[3]=cambioint();
printf(lcd_putc,"%c",key);
key='G';
keycount++;}
if(key!='G' && key<'A' && keycount==5){
tele[4]=cambioint();
printf(lcd_putc,"%c",key);
key='G';
keycount++;}
if(key!='G' && key<'A' && keycount==6){
tele[5]=cambioint();
printf(lcd_putc,"%c",key);
key='G';
keycount++;}
if(key!='G' && key<'A' && keycount==7){
tele[6]=cambioint();
printf(lcd_putc,"%c",key);
key='G';

```

```

        keycount++;}
    if(key!='G' && key<'A' && keycount==8){
        tele[7]=cambioint();
        printf(lcd_putc,"%c",key);
        key='G';
        keycount++;}
    if(key!='G' && key<'A' && keycount==9){
        tele[8]=cambioint();
        printf(lcd_putc,"%c",key);
        key='\0';
        keycount++;
        lcd_putc("\f");
        lcd_putc("Number saved");}
}

```

```

lcd_putc("\f Enviando datos");
delay_ms(2000);
keycount=11;
if (keycount==11){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (60);
    i2c_write(tele[0]);
    i2c_stop();
    delay_ms(50);
    keycount=12;
}

```

```

lcd_putc("\f 1 de 9");
delay_ms(2000);
if (keycount==12){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (61);
    i2c_write(tele[1]);
    i2c_stop();
    delay_ms(50);
    keycount=13;
}

```

```

lcd_putc("\f 2 de 9");
delay_ms(2000);
if (keycount==13){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (62);
    i2c_write(tele[2]);
    i2c_stop();
    delay_ms(50);
    keycount=14;
}

```

```
lcd_putc("\f 3 de 9");
delay_ms(2000);
if (keycount==14){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (63);
    i2c_write(tele[3]);
    i2c_stop();
    delay_ms(50);
    keycount=15;
}
```

```
lcd_putc("\f 4 de 9");
delay_ms(2000);
if (keycount==15){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (64);
    i2c_write(tele[4]);
    i2c_stop();
    delay_ms(50);
    keycount=16;
}
```

```
lcd_putc("\f 5 de 9");
delay_ms(2000);
if (keycount==16){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (65);
    i2c_write(tele[5]);
    i2c_stop();
    delay_ms(50);
    keycount=17;
}
```

```
lcd_putc("\f 6 de 9");
delay_ms(2000);
if (keycount==17){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (66);
    i2c_write(tele[6]);
    i2c_stop();
    delay_ms(50);
    keycount=18;
}
```

```
lcd_putc("\f 7 de 9");
delay_ms(2000);
if (keycount==18){
    i2c_start ();
```



```

    i2c_write (0xA0);
    i2c_write (67);
    i2c_write(tele[7]);
    i2c_stop();
    delay_ms(50);
    keycount=19;
}

lcd_putc("\f 8 de 9");
delay_ms(2000);
if (keycount==19){
    i2c_start ();
    i2c_write (0xA0);
    i2c_write (68);
    i2c_write(tele[8]);
    i2c_stop();
    delay_ms(50);
    keycount=11;
}

    lcd_putc("\f Number sent");
    delay_ms(2000);
    permiso=2;
}

//=====MAESTRO
void clavemaestra()
{
    lcd_putc("\f");
    lcd_putc("Codigo maestro");
    keycount=1;
    while(keycount<7)
    {
        key = kbd_getc();
        if(key!='G' && key!='1' && key!='2' && key!='3' && key!='4' && key!='5' && key!='6' &&
key!='7' && key!='8' && key!='9' && key!='0' && keycount==1){
            num[0]=cambioint();
            write_eeprom(1,num[0]);
            lcd_gotoxy(keycount,2);
            printf(lcd_putc,"%c", '*');
            key='G';
            keycount++;}

        if(key!='G' && keycount==2){
            num[1]=cambioint();
            write_eeprom(2,num[1]);
            lcd_gotoxy(keycount,2);
            printf(lcd_putc,"%c", '*');
            key='G';
            keycount++;}

        if(key!='G' && keycount==3){

```

```

    num[2]=cambioint();
    write_eeprom(3,num[2]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}

```

```

if(key!='G' && keycount==4){
    num[3]=cambioint();
    write_eeprom(4,num[3]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;
}

```

```

if(key!='G' && keycount==5){
    num[4]=cambioint();
    write_eeprom(5,num[4]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;
}

```

```

if(key!='G' && keycount==6){
    num[5]=cambioint();
    write_eeprom(6,num[5]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    delay_ms(500);
    key='G';
    keycount++;
}

```

```

}

```

```

keycount=0;
permiso=2;
}

```

```

//=====PANICO

```

```

void clavepanico(){
    lcd_putc("\f");
    lcd_putc("Codigo panico");
    keycount=1;
    while(keycount<7)
    {
        key = kbd_getc();
        if(key!='G' && key!='1' && key!='2' && key!='3' && key!='4' && key!='5' && key!='6' &&
key!='7' && key!='8' && key!='9' && key!='0' && keycount==1){
            num[0]=cambioint();

```

```

    write_eeprom(51,num[0]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}

if(key!='G' && keycount==2){
    num[1]=cambioint();
    write_eeprom(52,num[1]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}

if(key!='G' && keycount==3){
    num[2]=cambioint();
    write_eeprom(53,num[2]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}

if(key!='G' && keycount==4){
    num[3]=cambioint();
    write_eeprom(54,num[3]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;
}

if(key!='G' && keycount==5){
    num[4]=cambioint();
    write_eeprom(55,num[4]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;
}

if(key!='G' && keycount==6){
    num[5]=cambioint();
    write_eeprom(56,num[5]);
    lcd_gotoxy(keycount,2);
    printf(lcd_putc,"%c", '*');
    delay_ms(500);
    key='G';
    keycount++;
}

}

```

```

    keycount=0;
    permiso=2;
}

//=====USUARIO
void claveusuario(){
    lcd_putc("\f");
    lcd_putc("Codigo usuario");
    keycount=1;
    while(keycount<7)
    {
        key = kbd_getc();
        if(key!='G' && key!='1' && key!='2' && key!='3' && key!='4' && key!='5' && key!='6' &&
key!='7' && key!='8' && key!='9' && key!='0' && keycount==1){
            num[0]=cambioint();
            write_eeprom(11,num[0]);
            lcd_gotoxy(keycount,2);
            printf(lcd_putc,"%c", '*');
            key='G';
            keycount++;}

        if(key!='G' && keycount==2){
            num[1]=cambioint();
            write_eeprom(12,num[1]);
            lcd_gotoxy(keycount,2);
            printf(lcd_putc,"%c", '*');
            key='G';
            keycount++;}

        if(key!='G' && keycount==3){
            num[2]=cambioint();
            write_eeprom(13,num[2]);
            lcd_gotoxy(keycount,2);
            printf(lcd_putc,"%c", '*');
            key='G';
            keycount++;}

        if(key!='G' && keycount==4){
            num[3]=cambioint();
            write_eeprom(14,num[3]);
            lcd_gotoxy(keycount,2);
            printf(lcd_putc,"%c", '*');
            key='G';
            keycount++;
        }

        if(key!='G' && keycount==5){
            num[4]=cambioint();
            write_eeprom(15,num[4]);
            lcd_gotoxy(keycount,2);
            printf(lcd_putc,"%c", '*');
            key='G';

```

```

        keycount++;
    }

    if(key!='G' && keycount==6){
        num[5]=cambioint();
        write_eeprom(16,num[5]);
        lcd_gotoxy(keycount,2);
        printf(lcd_putc,"%c", '*');
        key='G';
        keycount++;
    }

}

keycount=0;
permiso=2;
}

//=====INTENTOS DE METER CODIGO
void cambiaintentos(){
    lcd_putc("\f");
    lcd_putc("Numero intentos");
    numintento=0;
    while(numintento==0){
        key = kbd_getc();
        if(key=='1'){
            lcd_gotoxy(1,2);
            lcd_putc("\f 1 intento");
            numintento=1;
            intento=0;
            delay_ms(1000);}
        if(key=='2'){
            lcd_gotoxy(1,2);
            lcd_putc("\f 2 intentos");
            numintento=2;
            intento=0;
            delay_ms(1000);}
        if(key=='3'){
            lcd_gotoxy(1,2);
            lcd_putc("\f 3 intentos");
            numintento=3;
            intento=0;
            delay_ms(1000);}
        if (key!='G' && key>'3'){
            lcd_gotoxy(1,2);
            lcd_putc("Intentos de mas");
        }

    }

permiso=2;
}

```

```

void muestratelefono(){
lcd_putc("\f");
lcd_putc("N° Telefono");
lcd_gotoxy(1,2);
printf(lcd_putc,"%u%u%u%u%u%u%u%u%u%u%u",tele[0],tele[1],tele[2],tele[3],tele[4],tele[5],tele[6],tele[7],tele[8]);
while (key!='D'){
key=kbd_getc();
}

}

```

//=====MENU DE CONFIGURACION

```

void menumaestro(){
lcd_putc("\f");
lcd_gotoxy(1,1);
lcd_putc("Abriendo menu...");
delay_ms(5000);
menuindex=0;
permiso=2;
while(menuindex<10){
key=kbd_getc();
if(key=='1' || (menuindex==8 && menu==1) || (menuindex==1 && menu==1) || menuindex==0){
lcd_putc("\f");
lcd_putc("1.Codigo maestro");
menuindex=1;
menu=0;}

if(key=='2' || (menuindex==2 && menu==1)){
lcd_putc("\f");
lcd_putc("2.Codigo panico");
menuindex=2;
menu=0;}

if(key=='3' || (menuindex==3 && menu==1)){
lcd_putc("\f");
lcd_putc("3.Codigo usuario");
menuindex=3;
menu=0;}

if(key=='4' || (menuindex==4 && menu==1)){
lcd_putc("\f");
lcd_putc("4.Numerointentos");
menuindex=4;
menu=0;}

if(key=='5' || (menuindex==5 && menu==1)){
lcd_putc("\f");
lcd_putc("5.Reinicia todo");
menuindex=5;
menu=0;}

```

```

if(key=='6' || (menuindex==6 && menu==1)){
lcd_putc("\f");
lcd_putc("6.Marca telefono");
menuindex=6;
menu=0;}
if(key=='7' || (menuindex==7 && menu==1) || (menuindex==9 && menu==1)){
lcd_putc("\f");
lcd_putc("7.Muestra numero");
menuindex=7;
menu=0;}

if(key=='A'){
menuindex++;
menu=1;
}

if(key=='B'){
if(menuindex==1){menuindex=9;}
else {menuindex--;}
menu=1;
}

if(key=='D'){
if (menuindex==1){key='G';delay_ms(200);clavemaestra();menuindex=10;}

else if (menuindex==2){key='G';delay_ms(200);clavepanico();menuindex=10;}

else if (menuindex==3){key='G';delay_ms(200);claveusuario();menuindex=10;}

else if (menuindex==4){key='G';delay_ms(200);cambaiintentos();menuindex=10;}

else if (menuindex==5){key='G';delay_ms(200);write_eeprom(0,13);menuindex=10;}

else if (menuindex==6){key='G';delay_ms(200);telefono();menuindex=10;}

else if (menuindex==7){key='G';delay_ms(200);muestratelefono();menuindex=10;}

}

if (key=='C'){key='G'; delay_ms(200);menuindex=10;}

}

}

//=====COMPROBAR CONTRASEÑA
void comprobar()
{
if (intento!=numintento){ permiso=1;}

else if (intento==numintento){permiso=0;}

```

```

if (num[0]==read_eeprom(11) && num[1]==read_eeprom(12) && num[2]==read_eeprom(13) &&
num[3]==read_eeprom(14) && num[4]==read_eeprom(15) && num[5]==read_eeprom(16) &&
intento<numintento && permiso==1){
intento=0;
lcd_putc("\f");
lcd_putc("Caja abierta");
gsmstatus=1;
smstomobile();
output_high(PIN_A3);
delay_ms(5000);
output_low(PIN_A3);
} //NUMERO CORRECTO, SE ABRE LA CAJA

```

```

else if (num[0]==read_eeprom(51) && num[1]==read_eeprom(52) && num[2]==read_eeprom(53)
&& num[3]==read_eeprom(54) && num[4]==read_eeprom(55) && num[5]==read_eeprom(56)){
permiso=1;
delay_ms(5000);
lcd_putc("\f");
lcd_putc("Abriendo caja");
lcd_gotoxy(1,2);
lcd_putc("*");
delay_ms(500);
lcd_gotoxy(2,2);
lcd_putc("*");
delay_ms(500);
lcd_gotoxy(3,2);
lcd_putc("*");
delay_ms(500);
lcd_gotoxy(4,2);
lcd_putc("*");
delay_ms(500);
lcd_gotoxy(5,2);
lcd_putc("*");
delay_ms(500);
lcd_gotoxy(6,2);
lcd_putc("*");
delay_ms(500);
lcd_gotoxy(7,2);
lcd_putc("*");
delay_ms(500);
lcd_gotoxy(8,2);
lcd_putc("*");
delay_ms(500);
lcd_putc("\f");
lcd_putc("Caja abierta");
gsmstatus=4;
smstomobile();
output_high(PIN_A3);
delay_ms(5000);
output_low(PIN_A3);
intento=numintento;} //NUMERO PANICO! LA CAJA SE ABRE PERO SE ACTIVA LA

```



## ALARMA

```
else if (num[0]==read_eeprom(1) && num[1]==read_eeprom(2) && num[2]==read_eeprom(3)
&& num[3]==read_eeprom(4) && num[4]==read_eeprom(5) && num[5]==read_eeprom(6)){
intento=0;
permiso=1;
menumaestro();} //MAESTRO ENTRA, SE ACTIVA EL MENU
```

```
else {
lcd_putc("\f");
lcd_putc("Codigo falso");
gsmstatus=2;
smstomobile();
intento++;
}
```

```
if (intento==numintento){ permiso=0;} //SE HAN SUPERADO LOS INTENTOS SE BLOQUEA
LA CAJA
```

```
    lcd_putc("\f");
    keycount=0;
}
```

```
//=====PROGRAMA PRINCIPAL
```

```
void main() {
```

```
    kbd_init();
    lcd_init();
    lcd_gotoxy(1,1);
    lcd_putc("Preparando ...");
    delay_ms(2000);
    permiso=1;
```

```
while(TRUE)
{
```

```
    inicio=read_eeprom(0);
    if (inicio!=12){
    clavemaestra();
    clavepanico();
    claveusuario();
    cambiaintentos();
    lcd_putc("\f");
    write_eeprom(0,12);
    }
```

```
if (permiso==2){permiso=1;}
```

```
    if(keycount==0 && permiso==1){
        lcd_putc("\f");
        lcd_putc("Marca codigo");
        keycount=1;}
```

```
else if (permiso==0 && bloq==0){
    bloq=1;
    lcd_putc("\f");
    lcd_putc("Caja bloqueada");
    keycount=1;}


```

```
key = kbd_getc();


```

```
if(key!='G' && keycount==1){
    num[0]=cambioint();
    lcd_gotoxy(1,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}


```

```
if(key!='G' && keycount==2){
    num[1]=cambioint();
    lcd_gotoxy(2,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}


```

```
if(key!='G' && keycount==3){
    num[2]=cambioint();
    lcd_gotoxy(3,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}


```

```
if(key!='G' && keycount==4){
    num[3]=cambioint();
    lcd_gotoxy(4,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}


```

```
if(key!='G' && keycount==5){
    num[4]=cambioint();
    lcd_gotoxy(5,2);
    printf(lcd_putc,"%c", '*');
    key='G';
    keycount++;}


```

```
if(key!='G' && keycount==6){
    num[5]=cambioint();
    lcd_gotoxy(6,2);
    printf(lcd_putc,"%c", '*');
    delay_ms(1000);
    key='G';
    keycount++;}


```

```
bloq=0;  
comprobar();  
keycount=0;  
}
```

```
}
```

```
}
```