ECE-MINI-PROJECT

HOME SECURITY SYSTEM

Submitted by:

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Abstract

We aim to create a home security system. This involves the providing access to the house by entering the correct password which allows the door to open whereas if the incorrect password is entered 3 times the alarm starts buzzing. This protects the owner from the invasion of any unauthorized individual. The project also saves electricity, by switching on the lights of the house only when the door opens and switches then off when the door closes.

Introduction

Home security is both the security hardware in place on a property as well as personal security practices. Security hardware includes doors, locks, alarm systems, lighting, motion detectors, security camera systems, etc. that are installed on a property; personal security involves practices such as ensuring doors are locked, alarms activated, windows closed, extra keys not hidden outside, etc. Perhaps one of the biggest benefits of having a monitored home security system is that your home is being monitored at all times even when you cannot do it yourself. These systems offer 24/7 monitoring, and can track any invasion that occurs at the home while you are away.

Project Details

The project is aimed to be a home security system. The user enters the password using the hex keypad and it will be compared to the set password. If the user enters the password wrong 3 times consecutively the buzzer is switched on. When correct password is entered the LED lights are switched ON and the door opens by rotating the stepper motor when the same password is entered the LED lights are switched OFF and the door is closed by rotating motor in opposite direction. LCD is used to display the password pressed by the user. We use the following components: -

- LCD
- Stepper motor
- LEDs
- Buzzer
- Hex Keypad

Code:

```
#include <LPC17xx.H>
#include "GLCD.H"
#include "Serial.h"
#include "lcd.h"

/* Function Prototypes */
void display(unsigned int k);
void Display_Lcd(char data[]);
void delay1(unsigned int i);
int keyscan(void);
void opendoor(void);
```

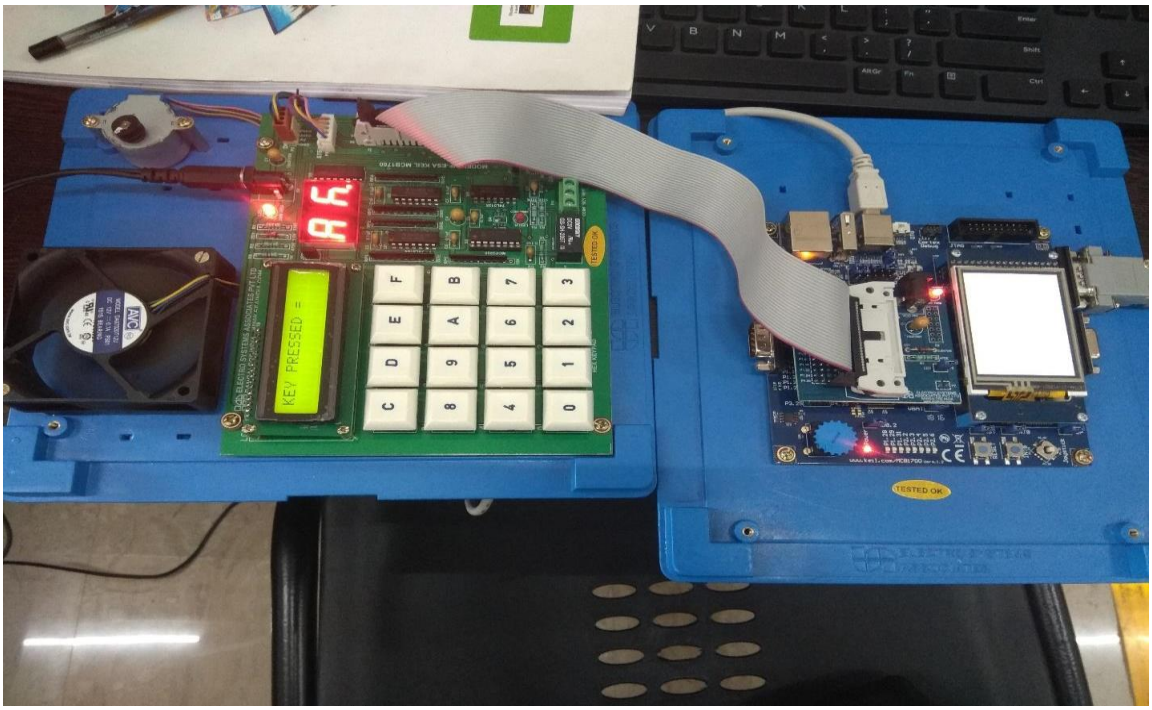
```
void closedoor(void);
void buzz(void);
void delay2(unsigned int x);

//Variable Declaration
unsigned char k;
unsigned int count=0;
unsigned int flag=0;
unsigned int i=1;


/* Main starts here */
int main()
{
      LPC_SC->PCONP     |=  (1<<15);                          /* POWER to GPIO */
      LPC_PINCON->PINMODE1 &= ~0x003FC000;                    /* Pull up the register */
      LPC_PINCON->PINMODE1 |= (2<<14) | (2<<16)|(2<<18)|(2<<20); /*pull down the
register */
      LPC_GPIO0->FIODIR |= ((1<<19)|(1<<20)|(1<<21)|(1<<22));  /* PortC as OUTPUT */
      LPC_GPIO0->FIODIR &= ~((1<<23)|(1<<24)|(1<<25)|(1<<26));  /* PortC as Input */
      LPC_GPIO1->FIODIR &=~0x02000000;       /* making that port Low first */
      LPC_GPIO1->FIODIR |=(0x02000000);
      LPC_GPIO1->FIODIR |=(1<<24);

     LPC_GPIO1->FIODIR |= 0xB0000000;  //LEDs on PORT1 are output(P1.28,P1.29,P1.31)
     LPC_GPIO2->FIODIR |= 0x0000007C;
     LPC_GPIO1->FIOPIN = 0x00000000;
     LPC_GPIO2->FIOPIN = 0x00000000;
      init_LCD();                          /* Initialiazation of LCD */
      write_Command(0x0c);                 /* display on cursor off*/
      while(1){
         write_Command(0x80);              /* Go to 1st line of LCD*/
         Display_Lcd("KEY PRESSED = ");
         k=keyscan();                      /* scan the keys*/
         write_Command(0x8E);              /* Move cursor to 14th location*/
         display(k);      /* Displays the key on LCD */
         if(k=='5'||k==5)
     {
      count=0;
      if(flag==1)
      {
       flag=0;
       closedoor();
      }
      else
      {
```

```
        flag=1;
        opendoor();
       }
      }
     else
     {
      count++;
     }


 if(count==3)
     {
      buzz();
     }
   LPC_SC->PCONP     |=  (1<<15);
      LPC_PINCON->PINMODE1 &= ~0x003FC000;
      LPC_PINCON->PINMODE1 |= (2<<14) | (2<<16)|(2<<18)|(2<<20);
      LPC_GPIO0->FIODIR |= ((1<<19)|(1<<20)|(1<<21)|(1<<22));  /* PortC as OUTPUT */
      LPC_GPIO0->FIODIR &= ~((1<<23)|(1<<24)|(1<<25)|(1<<26));  /* PortC as Input */
     }
}

          /* Delay Routine */
          void delay1(unsigned int i)     {
             unsigned int j,k;
             for(k=0;k<10;k++)
           for(j=0;j<i;j++);
          }
    /* Key Scan function */
          int keyscan(void){
            unsigned int i,s,code,j;
            while(1){
              code = 0;
               for(i=0x00080000; i<=0x00400000; i<<=1){        /* Check for 4 Scan lines */
                     LPC_GPIO0->FIOPIN = ((LPC_GPIO0->FIOPIN & 0xFF87FFFF) | i);    /*
          Make 1 scan line high  */
                    delay(3200);
                     s= LPC_GPIO0->FIOPIN & 0x07800000;
                    s = s >> 23;                        /* Since we are using P0.23 to P0.26 */
                     if(s>0){                           /* Read the scanned line */
                       for(j=0;j<4;j++){                    /* Check for 4 keys */
                         s>>=1;                           /* shifting data 1 bit right */
                         if(s==0)
                         return(code+j);                  /* If key Pressed return its code */
                       }
                        }
```

```
                code += 4;
              }
            }
          }
    /* Function for displaying on lcd*/
          void Display_Lcd(char data[])
          {
             int i;
             for(i=0;i<data[i];i++)
             write_Data(data[i]);

          }
/* Function converting decimal to hex codes*/
void display(unsigned int k)
          {
             if(k<=9)
              k=k+0x30;                          /* Adding 0 to hex code */
             else
              k=k+0x37;
             write_Data(k);
          }
          void opendoor(void)
          {
            LPC_GPIO1->FIODIR |= 0xB0000000;          /* LEDs on PORT1 are output
          (P1.28,P1.29,P1.31)    */
            LPC_GPIO2->FIODIR |= 0x0000007C;
            LPC_GPIO1->FIOPIN = 0xB0000000;
            LPC_GPIO2->FIOPIN = 0x0000007C;
            LPC_SC->PCONP |=(1<<15);
            LPC_GPIO0->FIODIR |=(1<<27)|(1<<28)|(1<<29)|(1<<30);
            LPC_GPIO1->FIODIR |= 0x01000000;
            i=1;
            while(i<=500)
            {
            LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x88000000;  /*
          Write data for clock wise direction */
              delay2(50000);
              LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x44000000;  /*
          Write data for clock wise direction */
              delay2(50000);
              LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x22000000;  /*
          Write data for clock wise direction */
              delay2(50000);
              LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x11000000;  /*
          Write data for clock wise direction */
              delay2(50000);
```

```
  i=i+1;
  }

}
void closedoor(void)
{
  LPC_GPIO1->FIODIR |= 0xB0000000;          /* LEDs on PORT1 are output
(P1.28,P1.29,P1.31)    */
  LPC_GPIO2->FIODIR |= 0x0000007C;
  LPC_GPIO1->FIOPIN = 0x00000000;
  LPC_GPIO2->FIOPIN = 0x00000000;
  LPC_SC->PCONP |=(1<<15);
  LPC_GPIO0->FIODIR |=(1<<27)|(1<<28)|(1<<29)|(1<<30);
  LPC_GPIO1->FIODIR |= 0x01000000;
  i=1;
  while(i<=500)
  {
   LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x11000000;  /*
Write data for anticlock wise direction */
     delay2(50000);
     LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x22000000;  /*
Write data for anticlock wise direction */
     delay2(50000);
     LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x44000000;  /*
Write data for anticlock wise direction */
     delay2(50000);
     LPC_GPIO0->FIOPIN = (LPC_GPIO0->FIOPIN & 0x87FFFFFF) | 0x88000000;  /*
Write data for anticlock wise direction */
     delay2(50000);
   i=i+1;
  }

}
void buzz(void)
{
 LPC_GPIO1->FIOPIN =0x02000000;        /* P1.25 making high relay */
 delay1(20);
 LPC_GPIO1->FIOPIN &=~(0x02000000);       /* P1.25 making low relay */
}
void delay2(unsigned int x)
{
 for(;x>0;x--);
}
```

Results: -



Drive link for Video:

https://drive.google.com/open?id=1l641IlHhAKH2HSrPrOMT1RRJPLLjyHZv

https://drive.google.com/open?id=17glk1JyVZIVNoLX1IIXF8cCnzz89mnAG

Conclusion

The required features are achieved and all the components are working according to the code. The password saved in system is the key '5', so when the user enters this password then door opens and switches ON the LED. The project has executed successfully and can be extended to include various other features the future.

Additional Remarks

Regarding Video

Currently the Password is 5 so when the user enters five the door will open which is indicated by stepper motor rotating clock-wise and all the LED's will be on and when the user again enters five while the door is already open it closes indicated by stepper-motor rotating anti-clockwise and all the LED's will be off and if the wrong password is entered three times wrong consecutively buzzer starts buzzing.

Kindly try to observe these features while watching these videos