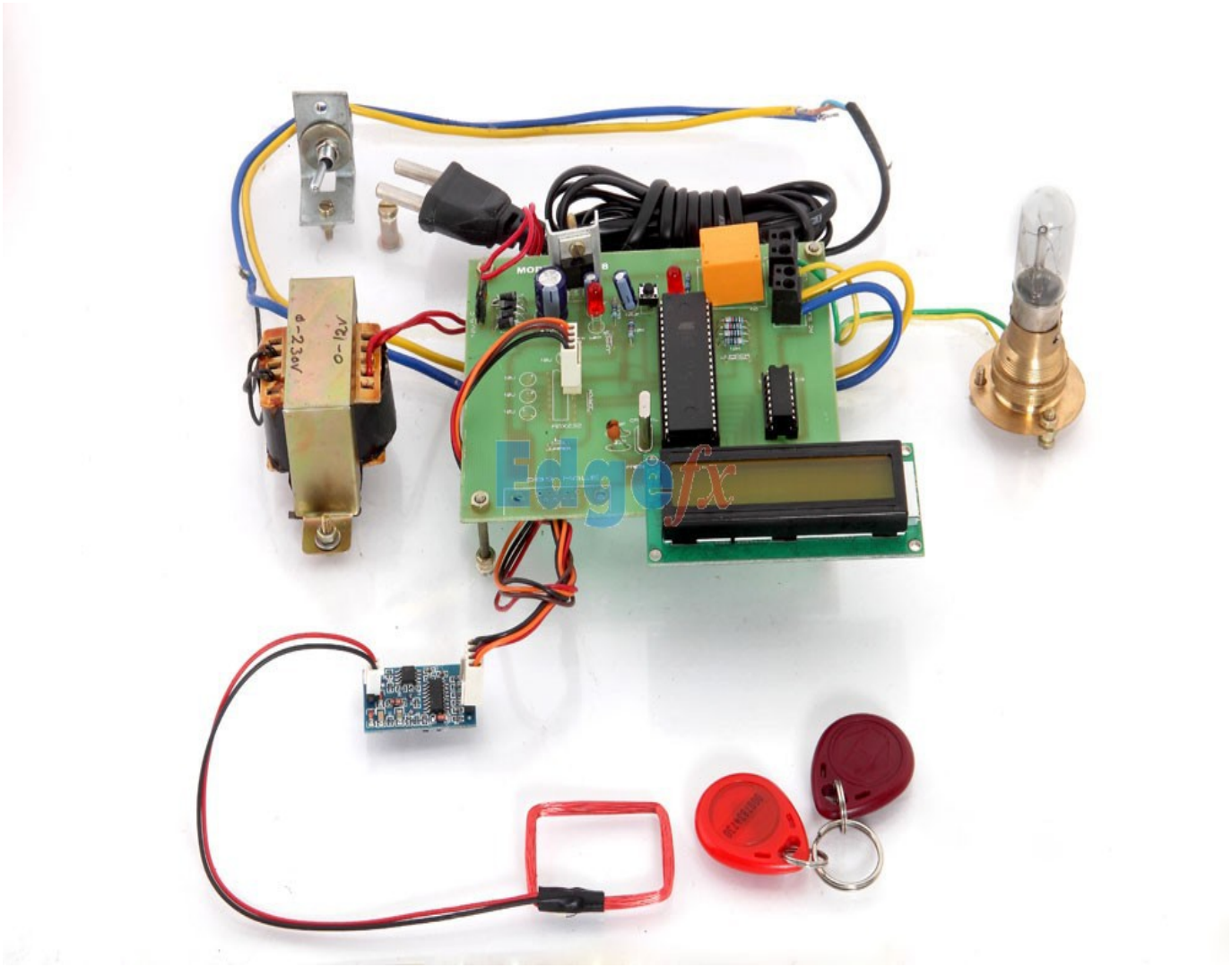

0-12V
Edgefx

ACCESS SECURITY SYSTEM USING RFID TAG

OBJECTIVE

The main objective of this project is to provide the technology which can be very beneficial is that RFID automated access for door controls to buildings, departments, rooms, secured closets (wiring, PBX, etc.) and cabinets is very cost effective and secure to use. Many people do not realize how easy it is to implement card access systems such as card access door or doors using RFID readers and RFID Cards or Keyfobs for Secured Access Control Management. You can even use smart readers for computer rooms and securing individual computers.

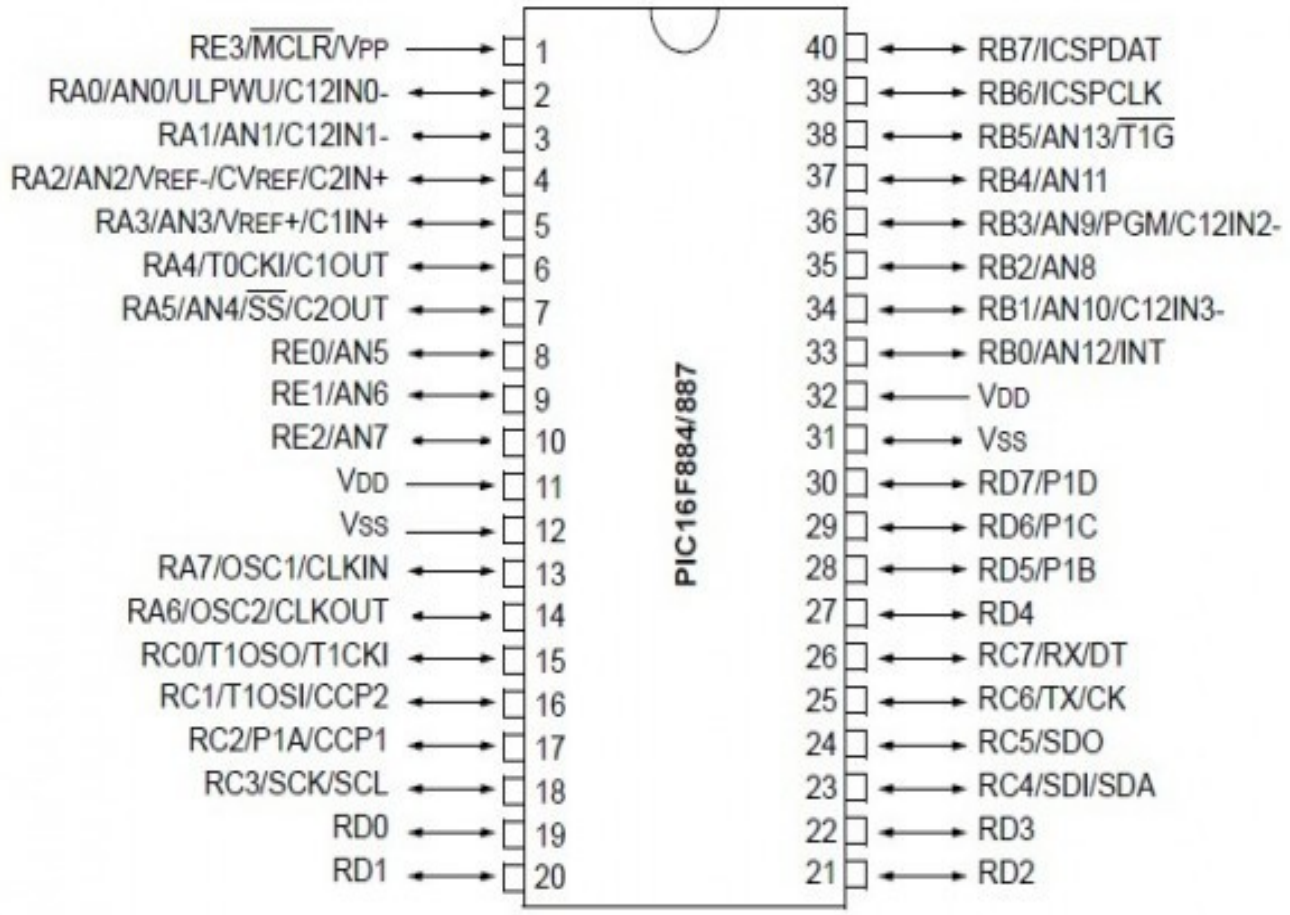
FEATURES

- ¾ Low power requirement.
- ¾ Excellent characters appearance.
- ¾ Reliability.
- ¾ Lower cost.

- RFID technology is based on the concept of magnetic coupling, which is the principle that current flowing in one circuit can induce current flow

in another circuit through a magnetic field generated in the space between the circuits.

PIC16F887 MICRO_CONTROLLER


PIC16F884/887
RE3/MCLR/VPP 1
RA0/AN0/ULPWU/C12IN0- 2
RA1/AN1/C12IN1- 3
RA2/AN2/VREF-/CVREF/C2IN+ 4
RA3/AN3/VREF+/C1IN+ 5
RA4/T0CKI/C1OUT 6
RA5/AN4/SS/C2OUT 7
RE0/AN5 8
RE1/AN6 9
RE2/AN7 10
VDD 11
VSS 12
RA7/OSC1/CLKIN 13
RA6/OSC2/CLKOUT 14
RC0/T1OSO/T1CKI 15
RC1/T1OSI/CCP2 16
RC2/P1A/CCP1 17
RC3/SCK/SCL 18
RD0 19
RD1 20
40 RB7/ICSPDAT
39 RB6/ICSPCLK
38 RB5/AN13/T1G
37 RB4/AN11
36 RB3/AN9/PGM/C12IN2-
35 RB2/AN8
34 RB1/AN10/C12IN3-
33 RB0/AN12/INT
32 VDD
31 VSS
30 RD7/P1D
29 RD6/P1C
28 RD5/P1B
27 RD4
26 RC7/RX/DT
25 RC6/TX/CK
24 RC5/SDO
23 RC4/SDI/SDA
22 RD3
21 RD2

BLOCK DIAGRAM

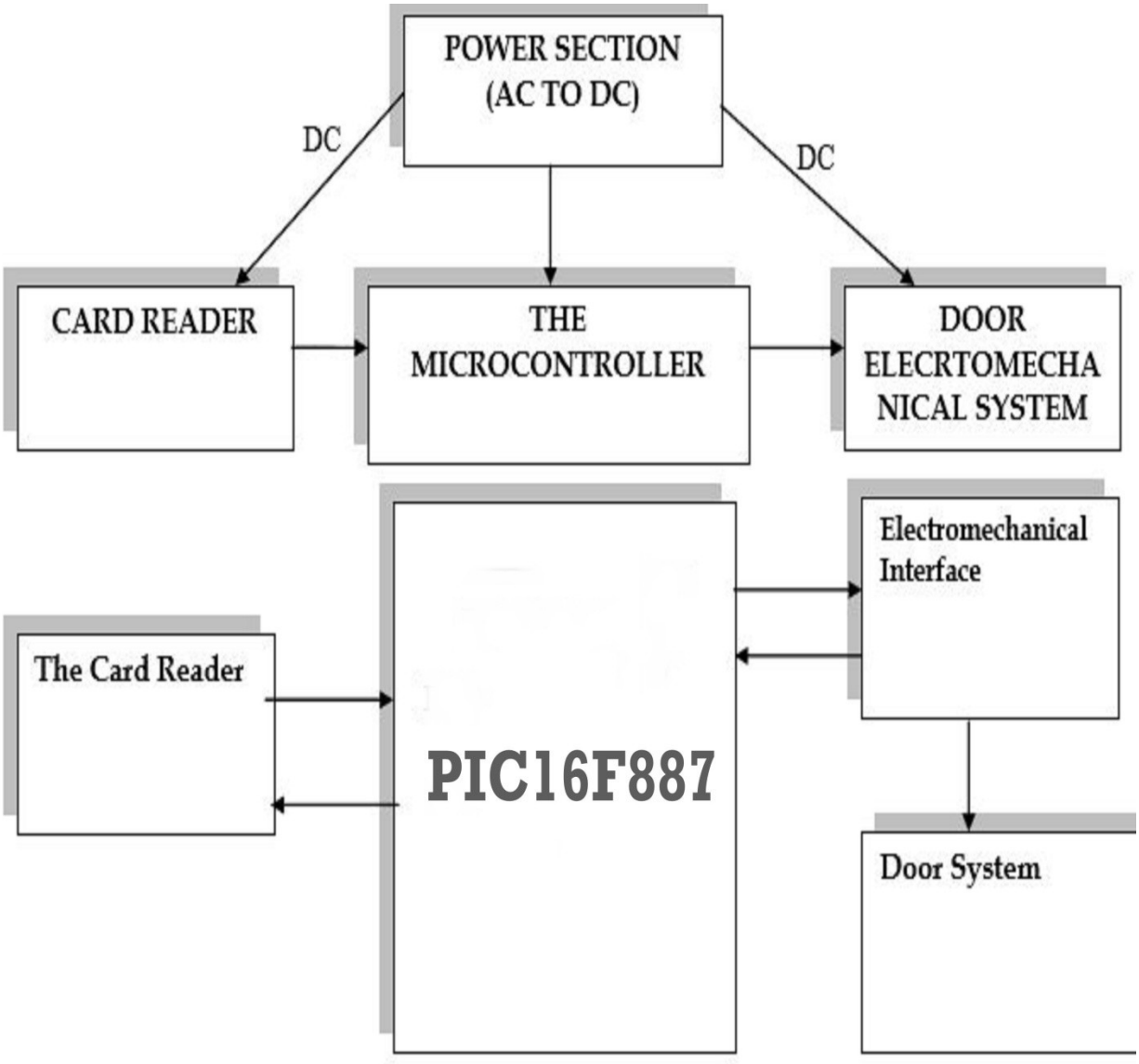
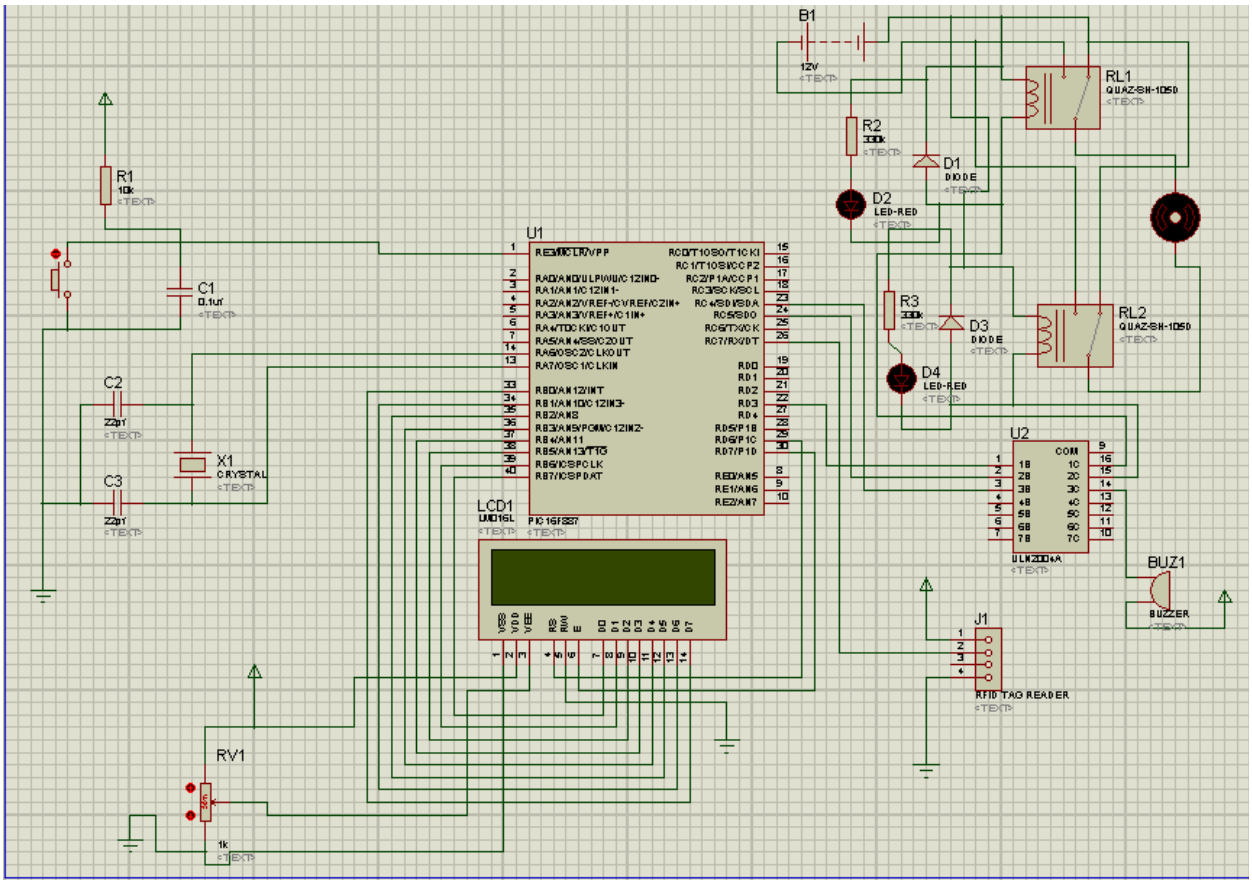
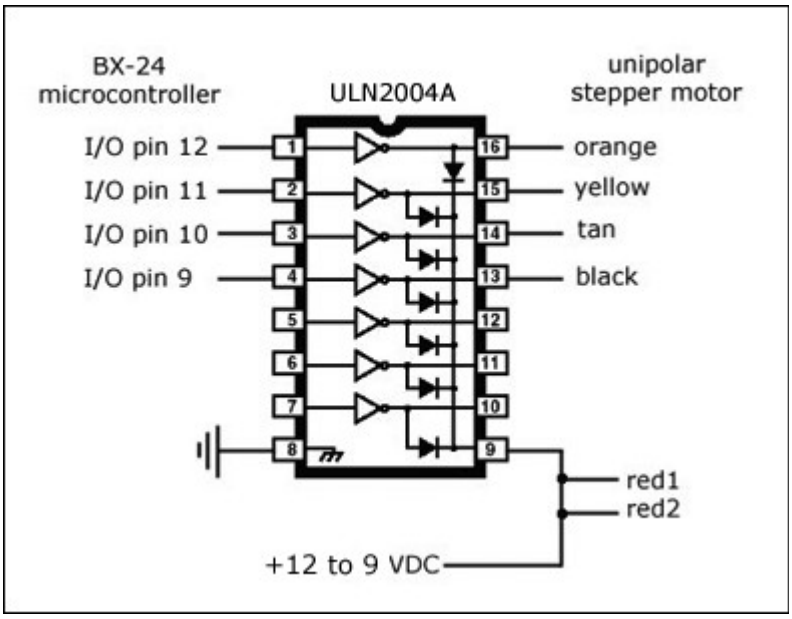


Figure 1: The Functional Block Diagram of the System.

CIRCUIT DIAGRAM :-


B1
12V
RL1
QUAZ-SH-105D
R2
D1
DIODE
D2
LED-RED
R1
U1
C1
0.1uF
C2
22p1
C3
22p1
X1
CRYSTAL
R3
D3
DIODE
RL2
QUAZ-SH-105D
D4
LED-RED
U2
ULN2003A
LCD1
LM016L
PIC16F887
BUZ1
BUZZER
J1
RFID TAG READER
RV1
1k

ULN2004



Features

- Seven Darlingtons per package
- Output current 500 mA per driver (600 mA peak)
- Output voltage 50 V
- Integrated suppression diodes for inductive loads
- Outputs can be paralleled for higher current
- TTL/CMOS/PMOS/DTL compatible inputs
- Inputs pinned opposite outputs to simplify layout

RFID Reader

An **RFID reader** is a device that is used to interrogate an RFID tag. The reader has an antenna that emits radio waves; the tag responds by sending back its data.

Radio-frequency identification (**RFID**) is a technology that uses radio waves to transfer data from an electronic tag, called RFID tag or label, attached to an object, through a reader for the purpose of identifying and tracking the object. Some RFID tags can be read from several meters away and beyond the line of sight of the reader.

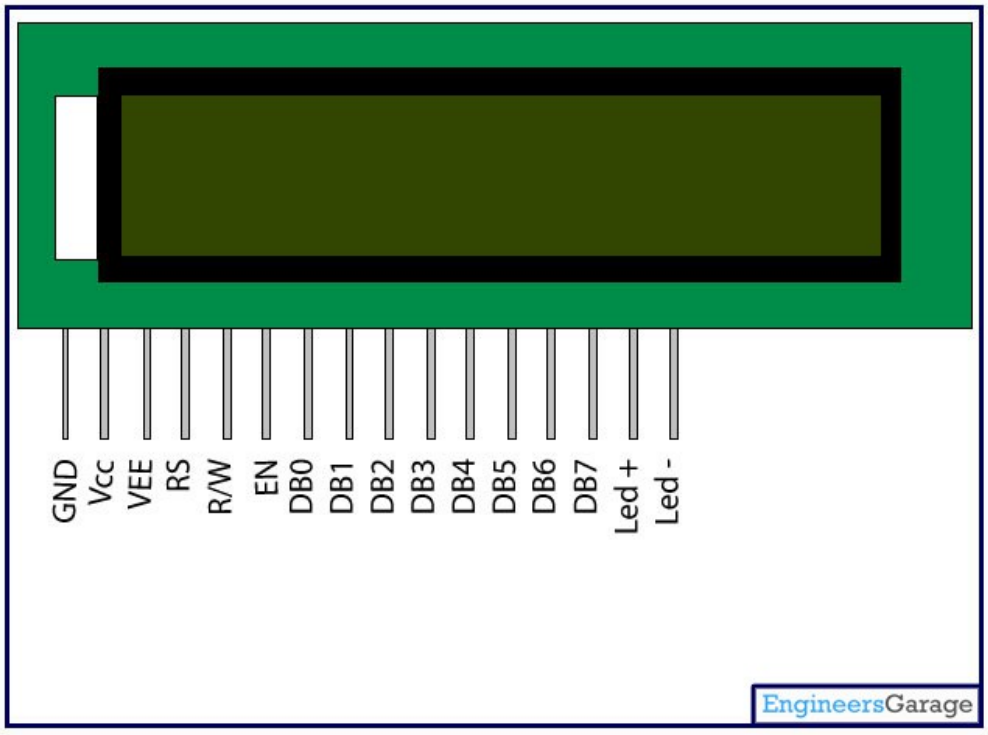
The RFID tag includes a small RF transmitter and receiver. An RFID reader transmits an encoded radio signal to interrogate the tag. The tag receives the message and responds with its identification information.

A basic RFID system consists of three components:

- An antenna or coil
- A transceiver (with decoder)

- A transponder (RF tag) electronically programmed with unique information

LCD (LIQUID CRYSTAL DISPLAY)



LCD means liquid crystal display, a type of display used in digital watches and many portables computers. LCD displays utilize two sheets of polarizing material with a liquid crystal solution between them. An electric current passed through the liquid causes the crystals to align so that light cannot pass through them.

Interface pin description

Pin no.	Symbol	External connection	Function
1	V_{SS}	Power supply	Signal ground for LCM
2	V_{DD}		Power supply for logic for LCM
3	V_0		Contrast adjust
4	RS	MPU	Register select signal
5	R/W	MPU	Read/write select signal
6	E	MPU	Operation (data read/write) enable signal
7~10	DB0~DB3	MPU	Four low order bi-directional three-state data bus lines. Used for data transfer between the MPU and the LCM. These four are not used during 4-bit operation.
11~14	DB4~DB7	MPU	Four high order bi-directional three-state data bus lines. Used for data transfer between the MPU
15	LED+	LED BKL power supply	Power supply for BKL
16	LED-		Power supply for BKL

BUZZER-

An electric signaling device, such as a doorbell, that makes a buzzing sound.

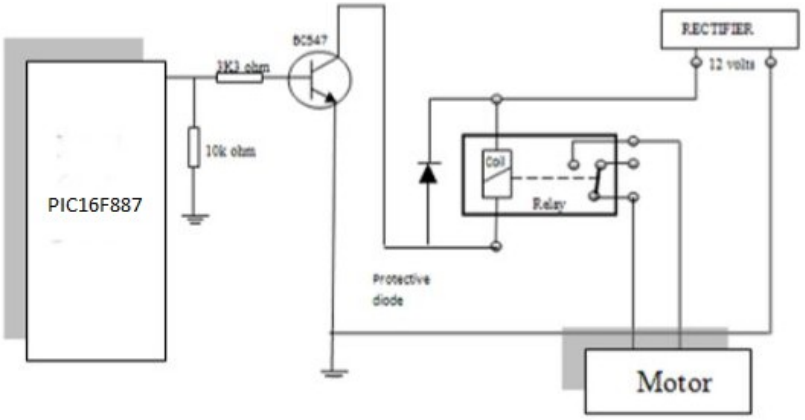
OR

1. A person or thing that buzzes
2. (Electronics) a device that produces a buzzing sound, esp one similar to an electric bell without a hammer or gong

Electromechanical Door Interface Circuit

In the model, a simple 12v DC motor and Rack and Pinion motion transmission systems were used to provide translatory motion for the door to open and close upon the command of the microcontroller unit to the relay circuitry.

The relay circuit is responsible for performing the switching action that energizes the motion transmission systems to perform door translatory motion operations. The relay circuit transforms the electrical signal from the PIC into mechanical movement that performs a switching mechanism to allow the door to open or close.



PROGRAM IN PROJECT

```
#include<pic.h>

#define LCD PORTB
#define RS RD6
#define EN RD7

#define Card1 29455


#define BUZZ RC5


//---------------------------------------------

void delay(unsigned long int);

void lcd_cmd_send(unsigned char);

void lcd_char_send(unsigned char);
```

```
void lcd_display(unsigned char *,unsigned char,unsigned char);

void lcd_num_dis(unsigned int,unsigned char);

void rfid();

//-----------------------------------------------



/*
================================================================
=======================
                                        RFID CARD LAST DIGIT
================================================================
=======================*/



/*
================================================================
=======================
```

TYPEDEF DECLARATION

==========
==========*/

```
typedef unsigned char BYTE;

typedef unsigned int UINT;

BYTE CardFlag=0,irx=0;

BYTE bufferin[6]={0};

UINT Cardno=0,Num;

bit ReceiverFlag=0;

int flag=0,flag1;
```

/*

==========
==========

INTERRUPT FUNCATION

==========
==========*/

```
static void interrupt isr(void)                                    // Here be
interrupt function - the  is unimportant.
{
        bufferin[irx]=RCREG;
                if(irx==4)
                {
                irx=0;
                ReceiverFlag=1;
                }
                irx++;
                RCIF=0;
}

//---------------------------------

void main(void)
{
        TRISC=0X80;
        TRISB=0x00;
        TRISD=0x00;
RD3=0;
RC4=0;
        lcd_cmd_send(0x38);
```

```
        lcd_cmd_send(0x01);
        lcd_cmd_send(0x0C);
        lcd_cmd_send(0x80);


        BUZZ=0;




//----------------------

        TXSTA=0x24;       //TRASMITER
        RCSTA=0x90;       //RECIVER
        SPBRG= 51;  // BAUD RATE 4800

   GIE=1;
        PEIE=1;
        RCIE=1;
        RCIF=0;

        lcd_cmd_send(0x01);
```

```
        lcd_display("WELCOME",1,0);
        lcd_display("INSERT YOUR CARD",2,0);

//---------------------------------


while(1)
{
rfid();
//flag1=1;
if(CardFlag==1&&flag==0)
{
flag=1;
delay(5000);
lcd_display("               ",2,0);
delay (100);
lcd_display(" PROCESSING...  ",1,0);
delay(100);
RD3=1;
RC4=0;
lcd_display("    UNLOCK     ",1,0);
delay(65000);
```

```
lcd_display("INSERT YOUR CARD",1,0);
CardFlag=0;
}
if(CardFlag==1&&flag==1)
{
flag=0;
delay (5000);
lcd_display(" PROCESSING...  ",1,0);
delay (100);
RD3=0;
RC4=1;
lcd_display("     LOCK       ",1,0);

delay(65000);
lcd_display("INSERT YOUR CARD",1,0);
lcd_display("                ",2,0);
CardFlag=0;

}
}
}
```

```
//--------------------------------
void delay(unsigned long int mdelay)
{
        while(mdelay--);
}
void lcd_cmd_send(unsigned char mcmd)
{
        LCD=mcmd;
        RS=0;
        EN=1;
        delay(25);
        EN=0;
        delay(100);

}
void lcd_char_send(unsigned char mchar)
{
        LCD=mchar;
        RS=1;
        EN=1;
        delay(25);
        EN=0;
```

```
        delay(100);


}
void lcd_display(unsigned char *slcd,unsigned char lcd_line,unsigned char
lcd_posi)
{       unsigned char ilcd=0;
        if(lcd_line==1)
        {
        lcd_cmd_send(0x80+lcd_posi);
        }
        if(lcd_line==2)
        {
        lcd_cmd_send(0xC0+lcd_posi);
        }


        while(slcd[ilcd]!='\0')
        {
                lcd_char_send(slcd[ilcd]);
                ilcd++;


        }
}
```

```
void lcd_num_dis(unsigned int lnum, unsigned char lposi)
{
unsigned int lunit,lten,lhun,ltho;
        lunit=lnum%10;
        lnum/=10;
        lten=lnum%10;

        lcd_cmd_send(lposi);

        lcd_char_send(lten+0x30);

        lcd_char_send(lunit+0x30);

}

void rfid()
{

  if(ReceiverFlag==1)
                {

                        irx=0;
```

```
                ReceiverFlag=0;

      Cardno=(256*bufferin[3])+bufferin[4];   // card no rotate to right

bufferin[0]=0;
                bufferin[1]=0;
                bufferin[2]=0;
                bufferin[3]=0;
                bufferin[4]=0;
                CardFlag=0;

                if(Cardno==Card1)
                 {
                        delay(3000);
                        CardFlag=1;
                 }

                else
                        {
                        delay(3000);
                        BUZZ=1;
                        lcd_display("UNKNOWN USER    ",2,0);
```

```
                    CardFlag=0;
                    delay(65000);
                    BUZZ=0;
          delay(65000);
                    lcd_display("INSERT YOUR CARD",2,0);
                    }

               }
}


//---------------------------------
```

APPLICATION

- RFID based Secured access system implemented on PIC16F887 microcontroller . This is a very useful application of RFID (Radio frequency identification) and is very commonly used in institutes ,offices, homes and so on.
- RFID automated access for door controls to buildings, departments, rooms, secured closets (wiring, PBX, etc.) and cabinets is very cost effective and secure to use.

- Many people do not realize how easy it is to implement card access systems such as card access door or doors using RFID readers and RFID Cards or Keyfobs for Secured Access Control Management.

ADVANTAGES

- you will not be required to carry a key. This makes it less likely that you'll lose the key and have a difficult time getting in to the home. It also means that you won't need to store a spare key somewhere on your property, as many home owners currently do. This poses a security risk, so eliminating the need for that additional key helps to make your home safer.

DISADVANTAGES

- Systems which are powered by electricity may not function properly in the case of a power failure. This can leave your door completely locked throughout the failure, or it may result in the door not locking properly and remaining open during the failure as well. Most systems have battery backup systems

FUTURE IMPROVMENTS

- Access based entrance and exits using access smart technology is rapidly becoming the way of the future for many businesses, government buildings, hospitals, museums and other establishments requiring secured but easy to control access solutions. Access based systems use either 125 kHz RFID or 13.56 MHz RFID readers, cards and keyfobs.