

LAMPIRAN

LAMPIRAN A LISTING PROGRAM

```
#include <reg51.H>
#define rs P2_6
#define en P2_7
#define sensor_barang_limit P2_5 //aktif lo
#define sensor_barang P2_3 //aktif lo
#define sensor_bocor P2_4 //aktif lo
#define push P2_0 //aktif hi
#define down P2_1 //aktif hi
#define lcd_mem P0
#define led_gagal P3_0 //aktif hi
#define led_ok P3_1 //aktif hi

void deteksi_barang(void);
void press_barang(void);
void tulis(unsigned char no_kal, unsigned char pos_Y, unsigned char pos_X, char
karakter);
void init_lcd();
void clr_lcd();
void tunda(unsigned char nilai);
unsigned char keypad(void); //ini fungsi

char code menu[9][16]={{"Waktu Deteksi ?"}, {"Waktu Press ? "}, {"Deteksi Barang
"}, {"Pressing On!!"},
{"Barang Baik! "}, {"Barang
Jelek!"}, {"Tekan Keypad!!"}, {"Masukkan Barang"}, {"Waktu Kosong!!"}};
unsigned char waktu_press[2], waktu_deteksi[2], barang;

void main(void)
{ unsigned char tomb_pos, press;
  push=0;
  down=1;
  led_gagal=0;
  led_ok=0;
  waktu_press[0]=0xff;
  waktu_press[1]=0xff;
  waktu_deteksi[0]=0xff;
  waktu_deteksi[1]=0xff;
  init_lcd();
  tulis(0,1,0,0);
  tomb_pos=6;
```



```

        }
        tomb_pos=6;

        break;

        case 1:if (((waktu_press[0]==0) &&
(waktu_press[1]==0)) || ((waktu_press[1]==0xff) && (waktu_press[0]==0xff)))
eror1: { clr lcd();
        tulis(8,1,0,0);
        tulis(6,2,1,0); //Tulis
        "Tekan Keypad!!" pada LCD
        tunda(4);
        while (keypad()==0);
        clr lcd();
        tulis(1,1,0,0);
        }
        else
        { if (waktu_press[1]==0xff)
        { if
(waktu_press[0]!=0)
        {
        waktu_press[1]=waktu_press[0];
        waktu_press[0]=0;
        }
        else goto
eror1;
        }
        while(1)
        {
        deteksi_barang();
        press_barang();
        }
        }
        break;
    }

    break;

    default: if (press==0)
    {

```

```

        tomb_pos++;
        if (tomb_pos==9)tomb_pos=8;
        waktu_deteksi[tomb_pos-7]=keypad()-'0';
        tulis(0,2,tomb_pos,waktu_deteksi[tomb_pos-
7]+'0');
    }
    else
    { tomb_pos++;
      if (tomb_pos==9)tomb_pos=8;
      waktu_press[tomb_pos-7]=keypad()-'0';
      tulis(0,2,tomb_pos,waktu_press[tomb_pos-
7]+'0');
    }
    break;
}
tunda(3);
}
}

```

```

void deteksi_barang(void)
{ unsigned char ulang_terus;

```

```

cek_lagi:
  clr lcd();
  if ((sensor_barang!=0) || (sensor_barang_limit!=0))
  {
    tulis(7,1,0,0);
    while ((sensor_barang!=0) || (sensor_barang_limit!=0));
  }
  tulis(2,1,0,0);
  tulis(0,2,7,'0');
  tulis(0,2,8,'0');

  ulang_terus=0;
  do
  { tunda(4);
    if ((sensor_barang!=0) || (sensor_barang_limit!=0)) goto cek_lagi;
    ulang_terus++;
    tulis(0,2,7,(ulang_terus/10)+'0'); //untuk memeriksa
    tulis(0,2,8,(ulang_terus%10)+'0'); //untuk memperoleh sisa pembagian
  }
  while (ulang_terus!=(waktu_deteksi[0]*10)+waktu_deteksi[1]);
}

```

```

void press_barang(void)
{
    unsigned char ulang_terus,bocor;
    clrlcd(); //Hapus semua tampilan
LCD
    tulis(3,1,0,0); //tulis Pressing On!! pada LCD
    tulis(0,2,7,'0');
    tulis(0,2,8,'0');
    bocor=0;
    push=1;
    down=0;
    ulang_terus=0;
    do
    {
        tunda(4);
        ulang_terus++;
        tulis(0,2,7,(ulang_terus/10)+'0');
        tulis(0,2,8,(ulang_terus%10)+'0');
        if (sensor_bocor==0)
        {
            bocor=1;
            goto hasil;
        }
    }
    while (ulang_terus!=(waktu_press[0]*10)+waktu_press[1]);

hasil:
    push=0;
    down=1;
    if (bocor==0)
    {
        led_gagal=0; //matikan Led Merah
        led_ok=1; //Nyalakan Led Hijau
        clrlcd();
        tulis(4,1,2,0); //Tulis "Barang Baik" pada LCD
        tulis(6,2,1,0); //Tulis "Tekan Keypad!!" pada LCD
        while (keypad()==0);
    }
    else
    {
        led_gagal=1; //Nyalakan Led Merah
        led_ok=0; //Matikan Led Hijau
        clrlcd();
        tulis(5,1,1,0); //Tulis "Barang Jelek!" pada LCD
        tulis(6,2,1,0); //Tulis "Tekan Keypad!!" pada LCD
        while (keypad()==0);
    }
}

```

```
}
```

```
void tulis(unsigned char no_kal, unsigned char pos_Y, unsigned char pos_X, char karakter)
```

```
{    unsigned char letak_mem;  
    unsigned char y;
```

```
    if (pos_Y==1) letak_mem=0x80;  
    if (pos_Y==2) letak_mem=0xC0;
```

```
    letak_mem=letak_mem+pos_X;  
rs=0;  
    lcd_mem=letak_mem;  
    en=1;  
    en=0;  
    tunda(1);
```

```
    rs=1;  
    if (karakter!=0)  
    {    lcd_mem=karakter;  
        en=1;  
        en=0;  
        tunda(2);  
    }
```

```
    else  
    {  
        for (y=0;menu[no_kal][y];y++){ lcd_mem=menu[no_kal][y]; //untuk  
menulis kalimat/karakter pada LCD  
        en=1;  
        en=0;  
        tunda(2);}  
    }  
}
```



```
rs=0;
lcd_mem=0x0C;
en=1;
en=0;
tunda(1);
```

```
rs=0;
lcd_mem=0x01;
en=1;
en=0;
tunda(1);
```

```
}
```

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

```
|                                     Prosedur untuk menghapus tampilan LCD  
|                                     |  
|                                     |
```

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

```
void clr lcd()  
{ rs=0;  
  lcd_mem=0x01;  
  en=1;  
  en=0;  
  tunda(1);  
}
```

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

```
|                                     Prosedur Delay untuk LCD & Keypad |  
|                                     |
```

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

```
void tunda(unsigned char nilai)  
{ unsigned char X;  
  switch(nilai)  
  {  
    case 1: TMOD=0x11;                                     //DELAY 15 ms  
            TH0=0xC5;  
            TL0=0x67;  
            untuk Init LCD
```

```

TR0=1;
TF0=0;
while (TF0==0);
break;

case 2: TMOD=0x11;
        TH0=0xFF;           //delay 50 us untuk jeda
tulisan ffCD
        TL0=0xCD;
        TR0=1;
        TF0=0;
        while (TF0==0);
        break;
case 3:  X=0;
        do
        {
            TH0=0x3C;       //delay 200 ms
            TL0=0xAF;
            TMOD=0x21;
            TR0=1;
            TF0=0;
            while (TF0==0);
            X++;
        }
        while(X!=4);
        break;
case 4: X=0;
        do
        {
            TH0=0x3C;       //delay 1 second
            TL0=0xAF;
            TMOD=0x21;
            TR0=1;
            TF0=0;
            while (TF0==0);
            X++;
        }
        while(X!=20);
        break;
}
}

```

```

unsigned char keypad(void)
{unsigned char perulangan,tombol,cek_baris[4]={0x7F,0xBF,0xDF,0xEF};
perulangan=0;
do {
P1=cek_baris[perulangan];
switch(P1)
{
case 0x77:   tombol='1';   //Angka 1
              break;
case 0x7B:   tombol='2';   //Angka 2
              break;
case 0x7D:   tombol='3';   //Angka 3
              break;
case 0x7E:   tombol='c';   //tombol Cor
              break;

case 0xB7:   tombol='4';   //Angka 4
              break;
case 0xBB:   tombol='5';   //Angka 5
              break;
case 0xBD:   tombol='6';   //Angka 6
              break;
// case 0xBE:  tombol='m';   //tombol Men0
//              break;

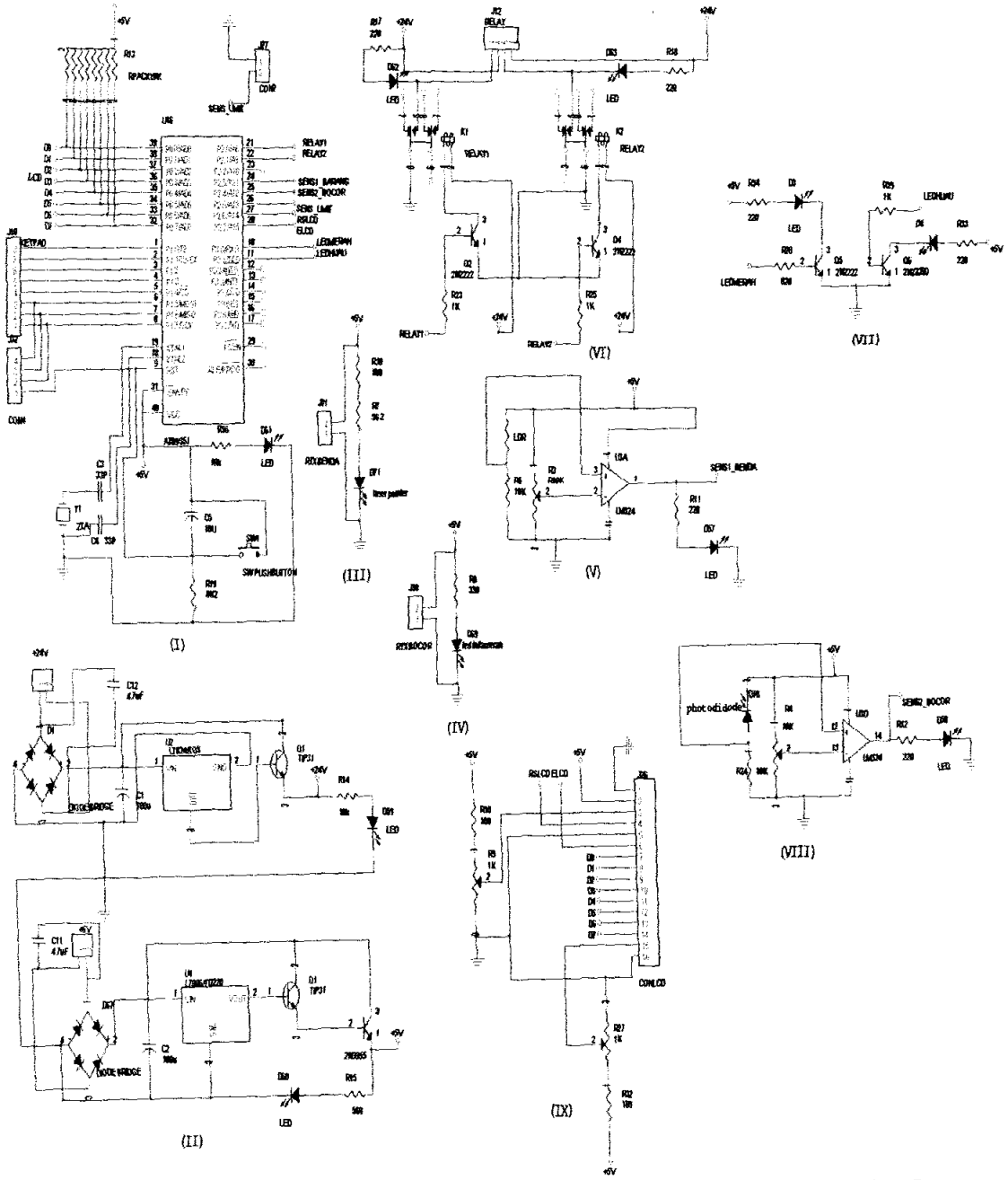
case 0xD7:   tombol='7';   //Angka 7
              break;
case 0xDB:   tombol='8';   //Angka 8
              break;
case 0xDD:   tombol='9';   //Angka 9
              break;

// case 0xDE:  tombol='u';   //tombol panah atas
//              break;
// case 0xE7:  tombol='C';   //tombol Can
//              break;
case 0xEB:   tombol='0';   //Angka 0
              break;
case 0xED:   tombol='e';   //tombol Ent
              break;
// case 0xEE:  tombol='d';   //tombol panah bawah
//              break;
default:    tombol=0;
            }
}

```

```
perulangan++;  
if (perulangan==4)perulangan=0;  
}  
while (tombol==0);  
    return(tombol);
```

LAMPIRAN B GAMBAR RANGKAIAN KESELURUHAN



created by Norma

Keterangan:

- (I) Rangkaian Mikrokontroler AT89S51
- (II) Rangkaian Catu Daya
- (III) Rangkaian Pemancar Sensor Benda Uji
- (IV) Rangkaian Pemancar Sensor *Inframerah* Untuk Pendeteksi Kebocoran Benda Uji
- (V) Rangkaian Penerima Sensor Untuk Pendeteksi Adanya Benda Uji
- (VI) Rangkaian *Driver Solenoid Valve*
- (VII) Rangkaian *Driver LED*
- (VIII) Rangkaian Penerima Sensor *Inframerah* Untuk Pendeteksi Kebocoran Benda Uji
- (IX) Rangkaian LCD

