

LAMPIRAN

## Lampiran 1 : Panduan Penggunaan Alat



- Langkah 1 : → Klik **AKI.exe**,

maka akan tampil *form* utama seperti Gambar disamping.

→ Jika tombol **Cek** ditekan, maka *form* **Cek aki** akan keluar

Tegangan Aki	<input type="text"/>
Nilai Suhu Tenda	<input type="text"/>
Kelembapan	<input type="text"/>
Cek	
Kembali	

<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>
Desain & Created By Zainal Anam

Tegangan Aki	15.1 V	Nilai Suhu Tenda	<input type="text"/>
Tegangan Peng	13 V	Kelembapan	<input type="text"/>
Amper	<input type="text"/>	Kelembapan	<input type="text"/>
Arus	<input type="text"/>	Kelembapan	<input type="text"/>

→ Jika tombol **Isi aki**, maka akan tampil *form* **Isi\_aki** keluar.

→ Jika tombol **Kosongkan aki**, maka akan tampil *form* **Kosongkan aki** akan keluar.

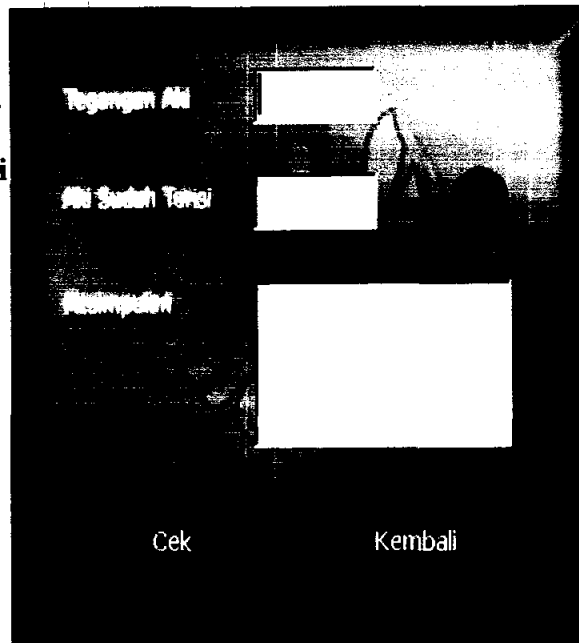
Tegangan Aki	16.5 V	Nilai Suhu Tenda	<input type="text"/>
Tegangan Peng	<input type="text"/>	Kelembapan	<input type="text"/>
Amper	<input type="text"/>	Kelembapan	<input type="text"/>
Arus	<input type="text"/>	Kelembapan	<input type="text"/>

- **Langkah 2 : Cek\_aki.**

→ setelah tombol **cek aki** ditekan, maka akan keluar *form cek\_aki* seperti disamping.

→ Untuk menjalankan *form* ini, maka tinggal menekan tombol **cek**.

→ dan bila ingin keluar. Tinggal Menekan tombol **kembali**.

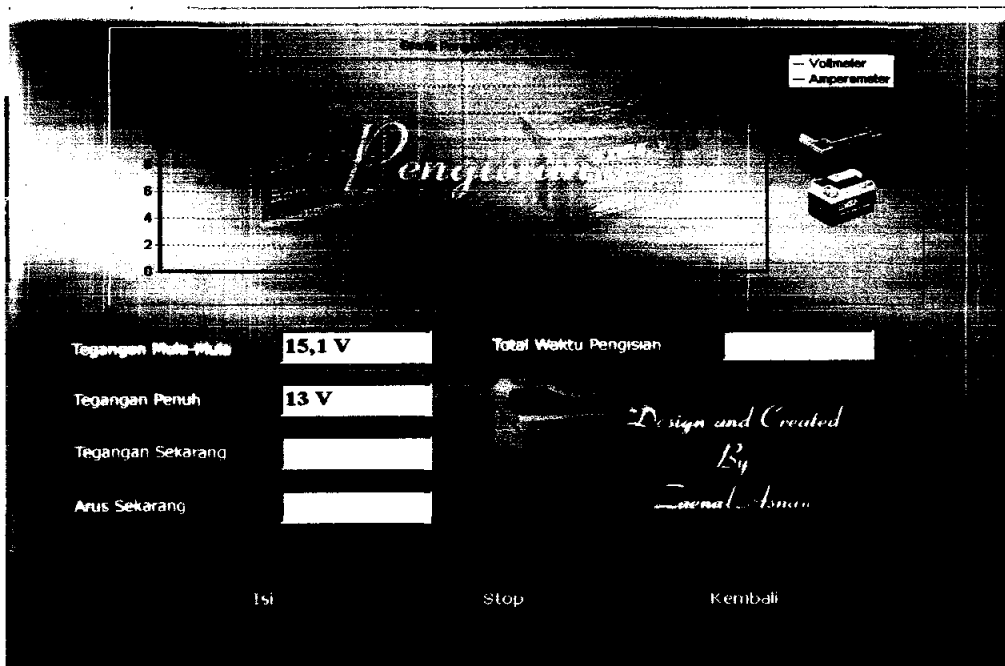


- **Langkah 3 : Pengisian aki**

→ Setelah tombol **Isi\_aki** ditekan, maka akan keluar *form Isi\_aki* seperti gambar dibawah.

→ Untuk menjalankan *form* ini, maka tinggal menekan tombol **Isi**.

→ dan bila ingin keluar. Tinggal Menekan tombol **kembali**.



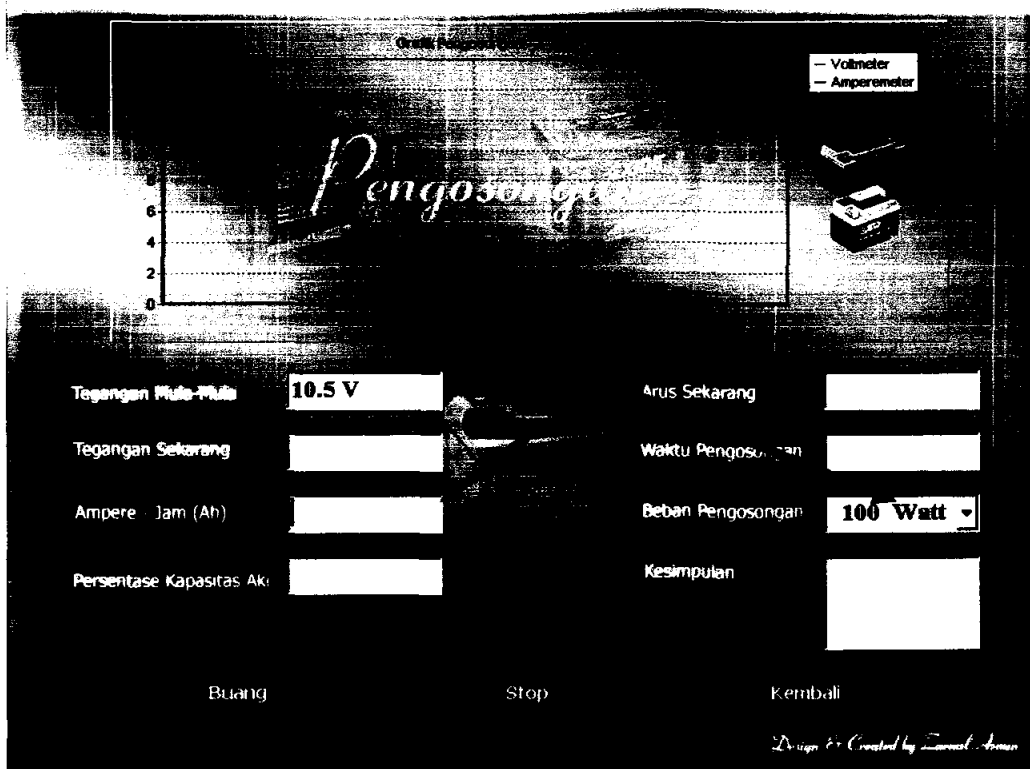
- **Langkah 4 : Pengosongan aki**

→ setelah tombol **Kosongkan\_aki** ditekan, maka akan keluar *form*

**Kosongkan\_aki** seperti gambar dibawah.

→ Untuk menjalankan form ini, masukkan nilai Ampere-jam (Ah) pada kolom Ah, kemudian tentukan beban pada kolom beban, maka tinggal menekan tombol **Buang**. Proses pengosongan akan berjalan secara otomatis selama kondisi yang telah ditentukan.

→ dan bila ingin keluar. Tinggal Menekan tombol **kembali**.



## Lampiran 2

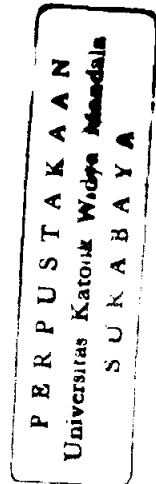
### Listing Program pada Mikrokontroler pada AT89S51

```
#include<stdio.h>
#include <reg51.H>
#define charging P3_7
#define ampere_polaritas P3_4
#define seratus_watt P3_6
#define lima_lima_watt P3_5

void terima_serial(void) interrupt 4 using 1;
void cek_aki();
void isi_aki();
void buang_aki();
delay(unsigned char);
void inisialisasi_serial();
void kirim_serial(unsigned char);

unsigned char pilihan,sibuk,beban;

void terima_serial(void) interrupt 4 using 1
{ if (RI==1)
    {   pilihan=SBUF;
        switch (pilihan)
        {   case 'X':beban=1;
                                break;
            case 'Y':beban=2;
                                break;
            case 'Z':beban=3;
                                break;
            case 'V':lima_lima_watt=0;
                                seratus_watt=0;
                                break;
            case 'E':ampere_polaritas=1;
                                break;
            case 'F':ampere_polaritas=0;
                                break;
            case 'D':charging=0;
                                break;
        }
    }
    RI=0;
```





```

//                                puluhan=0;
//                                break;
//                                case 0x30:ratusan=coba & 0x0F;
//                                kirim_serial(ratusan+0x30);
//                                ratusan=0;
//                                break;
//                                }
//                                }
}

void isi_aki()
{
    unsigned char selektor,ratusan,puluhan,satuan,coba;
    while(pilihan!='S')
    {
        charging=1;
        selektor=P0 & 0x70;
        coba=P0;
        switch (selektor)
        {
            case 0x60:satuan=coba & 0x0F;
            //                                kirim_serial(satuan+0x40);
            //                                satuan=0;
            //                                break;
            case 0x50:puluhan=coba & 0x0F;
            //                                kirim_serial(puluhan+0x50);
            //                                puluhan=0;
            //                                break;
            case 0x30:ratusan=coba & 0x0F;
            //                                kirim_serial(ratusan+0x60);
            //                                ratusan=0;
            //                                break;
            //                                }
            //                                }
        }
    }

void buang_aki()
{
    unsigned char selektor,ratusan,puluhan,satuan,coba;
    switch (beban)
    {
        case 1:lima_lima_watt=1;
            break;
        case 2:seratus_watt=1;
            break;
        case 3:lima_lima_watt=1;
            seratus_watt=1;
            break;
    }
}

```

```

}
while(pilihan!='S')
{
selektor=P0 & 0x70;
coba=P0;
switch (selektor)
{
case 0x60:satuan=coba & 0x0F;
//          kirim_serial(satuan+0x70);
//          satuan=0;
//          break;
case 0x50:puluhan=coba & 0x0F;
//          kirim_serial(puluhan+0x80);
//          puluhan=0;
//          break;
case 0x30:ratusan=coba & 0x0F;
//          kirim_serial(ratusan+0x90);
//          ratusan=0;
//          break;
}
}

void inisialisasi_serial()
{
SCON=0x50;
PCON=0x80;
TMOD=0x21;
TH1=0xFD; //Baudrate 9600
TF1=0;
TR1=1;
}

void kirim_serial(unsigned char ser)
{ //SBUF=ser;
//while(TI==0);
//TI=0;
if (sibuk==0)
{ SBUF=ser;
sibuk=1;
}
}

```



## Lampiran 3

### Listing Program Pada Komputer

- **Listing Program Menu utama**  
unit Menu;

interface

uses

Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,  
Dialogs, StdCtrls, Buttons;

type

TForm1 = class(TForm)  
  BitBtn1: TBitBtn;  
  BitBtn2: TBitBtn;  
  BitBtn3: TBitBtn;  
  Button1: TButton;  
  procedure BitBtn1Click(Sender: TObject);  
  procedure BitBtn2Click(Sender: TObject);  
  procedure BitBtn3Click(Sender: TObject);  
  procedure Button1Click(Sender: TObject);

private

  { Private declarations }

public

  { Public declarations }

end;

var

  Form1: TForm1;

implementation

uses cek\_aki, isi, kosong;

{ \$R \*.dfm }

procedure TForm1.BitBtn1Click(Sender: TObject);

begin

  Application.CreateForm(TCek, Cek);

  form1.enabled:=false;

end;

```

procedure TForm1.BitBtn2Click(Sender: TObject);
begin
  Application.CreateForm(TForm_Isi_aki, Form_Isi_aki);
  form1.enabled:=false;
end;

procedure TForm1.BitBtn3Click(Sender: TObject);
begin
  Application.CreateForm(TForm_pengosongan_aki, Form_pengosongan_aki);
  form1.enabled:=false;
end;

procedure TForm1.Button1Click(Sender: TObject);
begin
  close;
end;

end.

```

- **Listing Program pada form cek aki**  
unit Cek\_aki;

```
interface
```

```
uses
```

```
Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
Dialogs, StdCtrls, Buttons, CPort, ExtCtrls;
```

```
type
```

```
TCek = class(TForm)
```

```
  Label1: TLabel;
```

```
  Label2: TLabel;
```

```
  Label3: TLabel;
```

```
  Edit1: TEdit;
```

```
  Edit2: TEdit;
```

```
  BitBtn1: TBitBtn;
```

```
  BitBtn2: TBitBtn;
```

```
  Timer1: TTimer;
```

```
  ComPort1: TComPort;
```

```
  Memo1: TMemo;
```

```
  ijo: TImage;
```

```
  kuning: TImage;
```

```
  merah: TImage;
```

```
  procedure BitBtn2Click(Sender: TObject);
```

```
  procedure BitBtn1Click(Sender: TObject);
```

```
  procedure ComPort1RxChar(Sender: TObject; Count: Integer);
```

```

    procedure Timer1Timer(Sender: TObject);
private
    { Private declarations }
public
    { Public declarations }
end;

var
    Cek: TCek;
    dataku:string;
    ampere_buang,ampere_isi,volt:array[1..3] of byte;

implementation

uses Menu;

{$R *.dfm}

procedure TCek.BitBtn2Click(Sender: TObject);
begin
    comport1.WriteStr('S');
    comport1.ClearBuffer(true,true);
    comport1.Connected:=false;
    form1.Enabled:=true;
    close;
end;

procedure TCek.BitBtn1Click(Sender: TObject);
begin
    comport1.Connected:=true;
    comport1.WriteStr('C');
    comport1.ClearBuffer(true,true);
    timer1.Enabled:=true;
end;

procedure TCek.ComPort1RxChar(Sender: TObject; Count: Integer);
var coun,cek_dulu:byte;
begin
    COMPORT1.ReadStr(dataku,count);
    coun:=ord(dataku[1]);
    cek_dulu:=coun and $F0;
    coun:=coun and $0f;
    case cek_dulu of
        $10:volt[1]:=coun;
        $20:volt[2]:=coun;
    end;
end;

```

```

$30:volt[3]:=coun;
$40:ampere_isi[1]:=coun;
$50:ampere_isi[2]:=coun;
$60:ampere_isi[3]:=coun;
$70:ampere_buang[1]:=coun;
$80:ampere_buang[2]:=coun;
$90:ampere_buang[3]:=coun;
end;
comport1.ClearBuffer(true,true);
comport1.ClearBuffer(true,true);
end;

```

```

procedure TCek.Timer1Timer(Sender: TObject);
var prosentase,total:real;
    persen:string;
begin
{
edit1.Text:=inttostr(ampere_isi[3])+inttostr(ampere_isi[2])+','+inttostr(ampere_isi
[1]);}
total:=volt[3]*10+ volt[2] + volt[1]*0.1;
str(total:2:1,persen);
edit1.Text:=persen+' V';
{ total:=volt[3]*10+ volt[2] + volt[1]*0.1;}
prosentase:=((total-11)/(12.7-11))*100;
str(prosentase:2:1,persen);
if total<=7.2 then
begin
memo1.Text:='Aki Anda Rusak !';
ijo.Visible:=false;
kuning.Visible:=false;
merah.Visible:=true;
end
else
if (total>7.2) and (total<11) then
begin
memo1.Text:='Kapasitas Aki Sudah Menurun!!';
ijo.Visible:=false;
kuning.Visible:=false;
merah.Visible:=true;
end
else
if (total<12.4) then
begin
memo1.Text:='Aki Anda Harus Di Charge!!';
edit2.Text:=persen + ' %';
ijo.Visible:=false;

```

```

    kuning.Visible:=true;
    merah.Visible:=false;
end
else
if (total<12.7) and (total>12.4) then
begin
    memo1.Text:='Aki tak perlu di Charge';
    edit2.Text:=persen + ' %';
    ijo.Visible:=true;
    kuning.Visible:=false;
    merah.Visible:=false;
end
else
if (total>12.7) then
begin
    memo1.Text:='Aki tak perlu di Charge!!!';
    edit2.Text:='100 %';
    ijo.Visible:=true;
    kuning.Visible:=false;
    merah.Visible:=false;
end;
timer1.Enabled:=false;
end;

end.

```

• **Listing Program pada form isi\_aki**  
unit isi;

interface

uses

Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,  
Dialogs, StdCtrls, Buttons, ExtCtrls, TeeProcs, TeEngine, Chart, CPort,  
TeeFunci, Series;

type

```

TForm_Isi_aki = class(TForm)
    Chart1: TChart;
    Label1: TLabel;
    Label2: TLabel;
    Label3: TLabel;
    Edit1: TEdit;
    Edit2: TEdit;
    Edit3: TEdit;

```

```

Label5: TLabel;
Label6: TLabel;
Edit5: TEdit;
Edit6: TEdit;
BitBtn1: TBitBtn;
BitBtn2: TBitBtn;
BitBtn3: TBitBtn;
Series1: TLineSeries;
TeeFunction1: TAddTeeFunction;
Timer1: TTimer;
Timer2: TTimer;
Timer3: TTimer;
ComPort1: TComPort;
Series2: TLineSeries;
Timer4: TTimer;
procedure BitBtn3Click(Sender: TObject);
procedure Timer1Timer(Sender: TObject);
procedure FormCreate(Sender: TObject);
procedure Timer2Timer(Sender: TObject);
procedure ComPort1RxChar(Sender: TObject; Count: Integer);
procedure Timer3Timer(Sender: TObject);
procedure BitBtn1Click(Sender: TObject);
procedure BitBtn2Click(Sender: TObject);
procedure Timer4Timer(Sender: TObject);
private
  { Private declarations }
public
  { Public declarations }
end;

var
  Form_Isi_aki: TForm_Isi_aki;
  dataku:string;
  i:integer;
  labelnya:longint;
  ampere_buang,ampere_isi,volt,cadangan,cadangan_A:array[1..3] of byte;
  flag1,flag2:byte;
  waktuisi:integer;
  detik,jam,menit:integer;
  cek_volt:boolean;
  cek_tegangan:real;
  hitung:integer;
implementation

uses Menu;

```

```
{ $R *.dfm }
```

```
procedure TForm_Isi_aki.BitBtn3Click(Sender: TObject);
```

```
begin
```

```
    timer2.Enabled:=false;  
    timer1.Enabled:=false;  
    timer4.Enabled:=false;  
    timer3.Enabled:=false;  
    comport1.WriteStr('S');  
    comport1.WriteStr('D');  
    comport1.WriteStr('F');  
    comport1.Connected:=false;  
    form1.Enabled:=true;  
    close;
```

```
end;
```

```
procedure TForm_Isi_aki.Timer1Timer(Sender: TObject);
```

```
var temp,jumlah:integer;
```

```
    total_ampere,total:real;  
    totalnya_v,totalnya_a:string;
```

```
begin
```

```
    inc(waktuisi);  
    jam:=waktuisi div 3600;  
    temp:=waktuisi mod 3600;  
    menit:=temp div 60;  
    detik:=temp mod 60;  
    edit5.Text:=inttostr(jam)+' : '+inttostr(menit)+' : '+inttostr(detik)+' s';  
    if dataku<>" then
```

```
    begin
```

```
    { jumlah:=ord(dataku[1]);}  
    { edit3.Text:=inttostr(volt[3])+inttostr(volt[2])+','+inttostr(volt[1]);}  
    total:=volt[3]*10+ volt[2] + volt[1]*0.1;  
    total_ampere:=ampere_isi[3]+(ampere_isi[2]*0.1)+(ampere_isi[1]*0.01);  
    str(total:2:1,totalnya_v);  
    str(total_ampere:1:2,totalnya_A);  
    edit6.Text:=totalnya_A+' A';  
    { inttostr(ampere_isi[3])+','+inttostr(ampere_isi[2])+inttostr(ampere_isi[1]);}  
    edit3.Text:=totalnya_V+' V';  
    { inttostr(volt[3])+inttostr(volt[2])+','+inttostr(volt[1]);}
```

```
end
```

```
else
```

```
begin
```

```

edit3.Text:='0';
edit6.Text:='0';
end;

inc(i);
inc(labelnya);
chart1.Series[0].AddXY(i,total,inttostr(labelnya));
chart1.Series[1].AddXY(i,total_ampere,inttostr(labelnya));
{ if i=50 then
begin
{ i:=0;
chart1.Series[0].Clear;}
{ chart1.Series[0].AddXY(i,volt[1],inttostr(labelnya),500);}
{ end;}
{ if (total>14.9) and (total<15) then
begin
timer2.Enabled:=false;
timer1.Enabled:=false;
timer4.Enabled:=false;
comport1.WriteStr('S');
comport1.Writestr('D');
end;
}
end;

```

```

procedure TForm_Isi_aki.FormCreate(Sender: TObject);
begin
flag1:=0;
flag2:=0;
labelnya:=0;
hitung:=0;
cek_volt:=false;
i:=0;
comport1.Connected:=true;
comport1.WriteStr('C');
end;

```

```

procedure TForm_Isi_aki.Timer2Timer(Sender: TObject);
begin
{ timer2.Enabled:=false;}
comport1.WriteStr('S');
if flag1=0 then
begin
comport1.WriteStr('I');
flag1:=1;
end

```



```

else
begin
  comport1.WriteStr('C');
  flag1:=0;
end;
end;

```

```

procedure TForm_Isi_aki.ComPort1RxChar(Sender: TObject; Count: Integer);
var coun,cek_dulu:byte;
begin
  COMPORT1.ReadStr(dataku,count);
  coun:=ord(dataku[1]);
  cek_dulu:=coun and $F0;
  coun:=coun and $0f;
  case cek_dulu of
    $10:volt[1]:=coun;
    $20:volt[2]:=coun;
    $30:volt[3]:=coun;
    $40:ampere_isi[1]:=coun;
    $50:ampere_isi[2]:=coun;
    $60:ampere_isi[3]:=coun;
    $70:ampere_buang[1]:=coun;
    $80:ampere_buang[2]:=coun;
    $90:ampere_buang[3]:=coun;
  end;
  comport1.ClearBuffer(true,true);
  comport1.ClearBuffer(true,true);

end;

```

```

procedure TForm_Isi_aki.Timer3Timer(Sender: TObject);
var tampil:string;
begin
  if cek_volt then
  begin
    cek_tegangan:=volt[3]*10+volt[2]+volt[1]*0.1;
    str(cek_tegangan:2:1,tampil);
    { edit4.Text:=tampil+' V';}
    if cek_tegangan>13.3 then
    begin
      timer3.enabled:=false;
      str(cek_tegangan:2:1,tampil);
      edit3.Text:=tampil+' V';
      timer1.Enabled:=false;
      timer2.Enabled:=false;
      timer4.Enabled:=false;
    end;
  end;
end;

```

```

    comport1.WriteStr('S');
    comport1.Writestr('D');
end
else
begin
    cek_volt:=false;
    comport1.WriteStr('S');
    comport1.WriteStr('I');
    comport1.WriteStr('S');
    comport1.WriteStr('C');
    timer1.Enabled:=true;
    timer2.Enabled:=true;
    volt[1]:=cadangan[1];
    volt[2]:=cadangan[2];
    volt[3]:=cadangan[3];
    ampere_isi[1]:=cadangan_A[1];
    ampere_isi[2]:=cadangan_A[2];
    ampere_isi[3]:=cadangan_A[3];
end;
end
else
edit1.Text:=inttostr(volt[3])+inttostr(volt[2])+','+inttostr(volt[1])+ ' V';
timer3.Enabled:=false;
end;

```

```

procedure TForm_Isi_aki.BitBtn1Click(Sender: TObject);
begin

```

```

    waktuisi:=0;
    comport1.WriteStr('E');
    timer4.Enabled:=true;
    timer1.Enabled:=true;
    timer2.Enabled:=true;
end;

```

```

procedure TForm_Isi_aki.BitBtn2Click(Sender: TObject);
begin

```

```

    timer1.Enabled:=false;
    timer2.Enabled:=false;
    timer4.Enabled:=false;
    timer3.Enabled:=false;
    comport1.WriteStr('S');
    comport1.Writestr('D');
end;

```

```

procedure TForm_Isi_aki.Timer4Timer(Sender: TObject);
begin

```

```

    comport1.WriteStr('S');
    cadangan[1]:=volt[1];

```

```

cadangan[2]:=volt[2];
cadangan[3]:=volt[3];
cadangan_A[1]:=ampere_isi[1];
cadangan_A[2]:=ampere_isi[2];
cadangan_A[3]:=ampere_isi[3];
comport1.WriteStr('D');
comport1.WriteStr('C');
cek_volt:=true;
timer3.Enabled:=true;
timer1.Enabled:=false;
timer2.Enabled:=false;
end;

```

end.

- **Listing Program pada form kosong\_aki**

unit kosong;

interface

uses

Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,  
Dialogs, StdCtrls, Buttons, ExtCtrls, TeeProcs, TeEngine, Chart, CPort,  
Series;

type

```

TForm_pengosongan_aki = class(TForm)
  Chart1: TChart;
  Label1: TLabel;
  Label3: TLabel;
  Edit1: TEdit;
  Edit3: TEdit;
  Label5: TLabel;
  Label6: TLabel;
  Edit5: TEdit;
  Edit6: TEdit;
  BitBtn1: TBitBtn;
  BitBtn2: TBitBtn;
  BitBtn3: TBitBtn;
  ComboBox1: TComboBox;
  Label2: TLabel;
  ComPort1: TComPort;
  Timer1: TTimer;
  Timer2: TTimer;
  Timer3: TTimer;
  Series1: TLineSeries;
  Edit2: TEdit;

```

```

Label8: TLabel;
Label9: TLabel;
Edit8: TEdit;
Series2: TLineSeries;
Label10: TLabel;
Memo1: TMemo;
procedure BitBtn3Click(Sender: TObject);
procedure FormCreate(Sender: TObject);
procedure BitBtn1Click(Sender: TObject);
procedure BitBtn2Click(Sender: TObject);
procedure Timer1Timer(Sender: TObject);
procedure Timer2Timer(Sender: TObject);
procedure Timer3Timer(Sender: TObject);
procedure ComPort1RxChar(Sender: TObject; Count: Integer);
private
  { Private declarations }
public
  { Public declarations }
end;

var
  Form_pengosongan_aki: TForm_pengosongan_aki;
  dataku:string;
  buang:boolean;
  ampere_buang,ampere_isi,volt:array[1..3] of byte;
  total_awal:real;
  flag1,flag2:byte;
  i:integer;
  labelnya:longint;
  jam,menit,temp,hitung,detik,dtk:integer;
  watt:real;

implementation

uses Menu;

{$R *.dfm}

procedure TForm_pengosongan_aki.BitBtn3Click(Sender: TObject);
begin
  timer1.Enabled:=false;
  timer2.Enabled:=false;
  comport1.WriteStr('S');
  comport1.WriteStr('V');
  comport1.Connected:=false;
  form1.Enabled:=true;

```

```
close;  
end;
```

```
procedure TForm_pengosongan_aki.FormCreate(Sender: TObject);  
begin  
    flag1:=0;  
    flag2:=0;  
    comport1.Connected:=true;  
    combobox1.ItemIndex:=0;  
    comport1.WriteStr('C');  
end;
```

```
procedure TForm_pengosongan_aki.BitBtn1Click(Sender: TObject);  
var ii:real;  
begin  
    if edit8.Text="" then MessageDlg('Nilai Ah belum Diisi!!',  
        mtError,[mbOk],0)  
    else  
        begin  
            buang:=true;  
            hitung:=0;  
            comport1.WriteStr('F');  
            detik:=0;  
            timer1.Enabled:=true;  
            timer2.Enabled:=true;  
            case combobox1.ItemIndex of  
            0:begin  
                comport1.WriteStr('Y');  
                ii:=6;  
            end;  
            1:begin  
                comport1.WriteStr('Z');  
                ii:=2.5;  
            end;  
            end;  
            watt:=((strtoint(edit8.Text)*ii));  
            comport1.WriteStr('B');  
            end;  
end;
```

```
procedure TForm_pengosongan_aki.BitBtn2Click(Sender: TObject);  
var hasil:real;  
    hasil_tampil:string;  
begin  
    if buang then  
        begin
```

```

    buang:=true;
    timer1.Enabled:=false;
    timer2.Enabled:=false;
    hasil:=((detik/60)/watt)*100;
    str(hasil:2:2,hasil_tampil);
    edit1.Text:=hasil_tampil+' %!';
    comport1.WriteStr('S');
    comport1.WriteStr('V');
    if hasil<75 then memo1.Text:='Aki tidak layak pakai!'
    else
        memo1.Text:='Aki Masih layak pakai!';
    end
end
else
    MessageDlg('Tombol buang belum ditekan!!',
        mtError,[mbOk],0);
end;

```

```

procedure TForm_pengosongan_aki.Timer1Timer(Sender: TObject);
var hasil,total_ampere,total:real;

```

```

    hasil_tampil,totalnya_v,totalnya_a:string;
begin
    inc(detik);
    jam:=detik div 3600;
    temp:=detik mod 3600;
    menit:=temp div 60;
    dtk:=temp mod 60;
    edit5.Text:=inttostr(jam)+' : '+inttostr(menit)+' : '+inttostr(dtk)+' s';
    if dataku<>" then
    begin
        total:=volt[3]*10+ volt[2] + volt[1]*0.1;

```

```

total_ampere:=ampere_buang[3]+(ampere_buang[2]*0.1)+(ampere_buang[1]*0.0
1);

```

```

    str(total:2:1,totalnya_v);
    str(total_ampere:1:2,totalnya_A);
    edit2.Text:=totalnya_A+' A';
    edit6.Text:=totalnya_V+' V';
end
else
begin
    edit2.Text:='0';
    edit6.Text:='0';
end;

```

```

end;
inc(i);
inc(labelnya);
chart1.Series[0].AddXY(i,total,inttostr(labelnya));

```

```

chart1.Series[1].AddXY(i,total_ampere,inttostr(labelnya));
if (total<10) then inc(hitung)
else hitung:=0;
if hitung=10 then
begin
  hasil:=((detik/60)/watt)*100;
  str(hasil:2:2,hasil_tampil);
  edit1.Text:=hasil_tampil+' %';;
  timer1.Enabled:=false;
  timer2.Enabled:=false;
  comport1.WriteStr('S');
  comport1.WriteStr('V');
  if hasil<75 then memo1.Text:='Aki tidak layak pakai!'
  else
  memo1.Text:='Aki Masih layak pakai!';
  buang:=false;
end;

```

end;

```

procedure TForm_pengosongan_aki.Timer2Timer(Sender: TObject);
begin
  comport1.WriteStr('S');
  if flag1=0 then
  begin
    comport1.WriteStr('B');
    flag1:=1;
  end
  else
  begin
    comport1.WriteStr('C');
    flag1:=0;
  end;
end;

```

```

procedure TForm_pengosongan_aki.Timer3Timer(Sender: TObject);
var
  karakter:string;
begin
  total_awal:=volt[3]*10+ volt[2] + volt[1]*0.1;
  str(total_awal:2:1,karakter);
  edit3.Text:=karakter+' V';
  timer3.Enabled:=false;
end;

```

```

procedure TForm_pengosongan_aki.ComPort1RxChar(Sender: TObject;

```

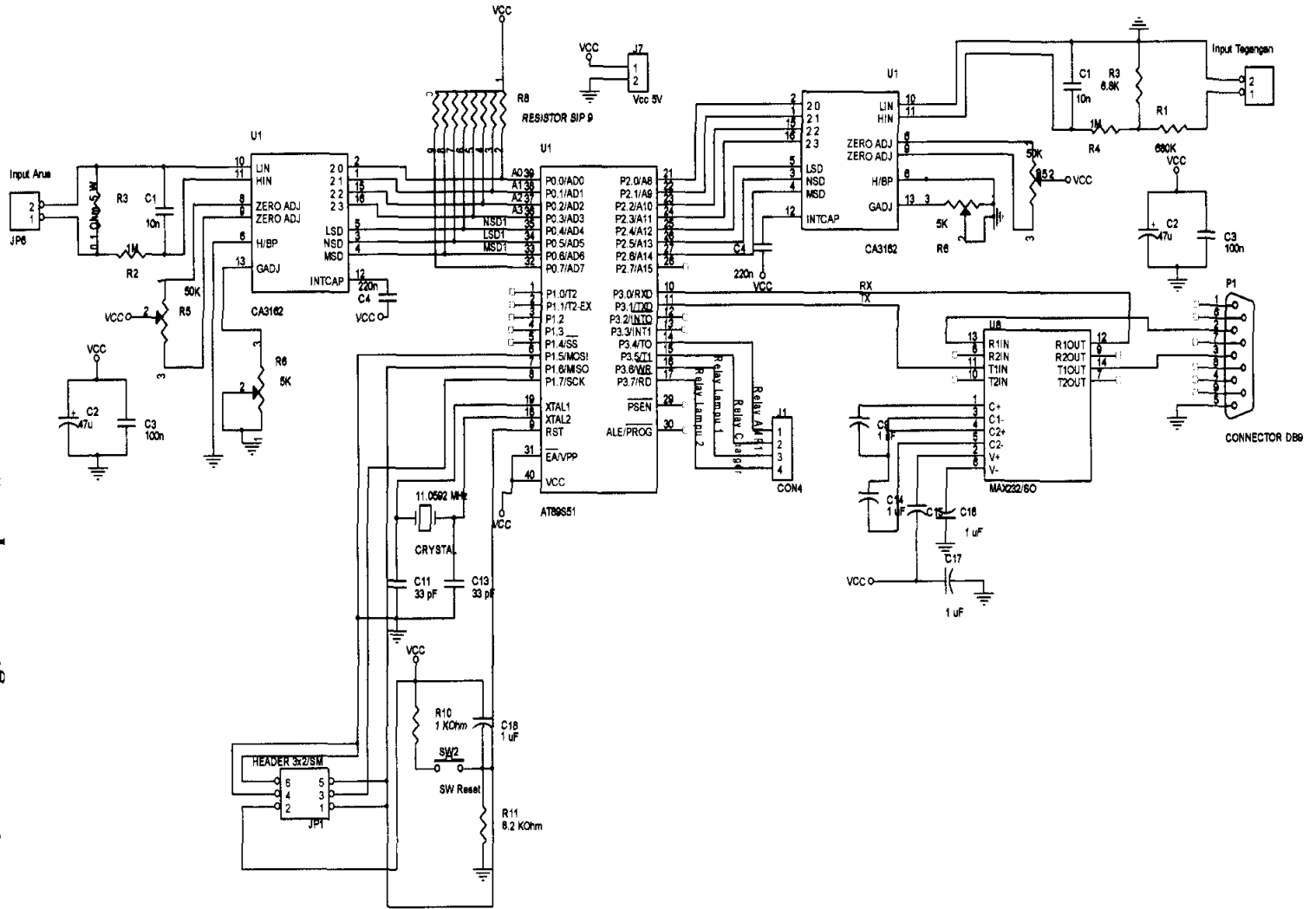
```
Count: Integer);
var coun,cek_dulu:byte;
begin
  COMPORT1.ReadStr(dataku,count);
  coun:=ord(dataku[1]);
  cek_dulu:=coun and $F0;
  coun:=coun and $0f;
  case cek_dulu of
    $10:volt[1]:=coun;
    $20:volt[2]:=coun;
    $30:volt[3]:=coun;
    $40:ampere_isi[1]:=coun;
    $50:ampere_isi[2]:=coun;
    $60:ampere_isi[3]:=coun;
    $70:ampere_buang[1]:=coun;
    $80:ampere_buang[2]:=coun;
    $90:ampere_buang[3]:=coun;
  end;
  comport1.ClearBuffer(true,true);
  comport1.ClearBuffer(true,true);
end;

end.
```

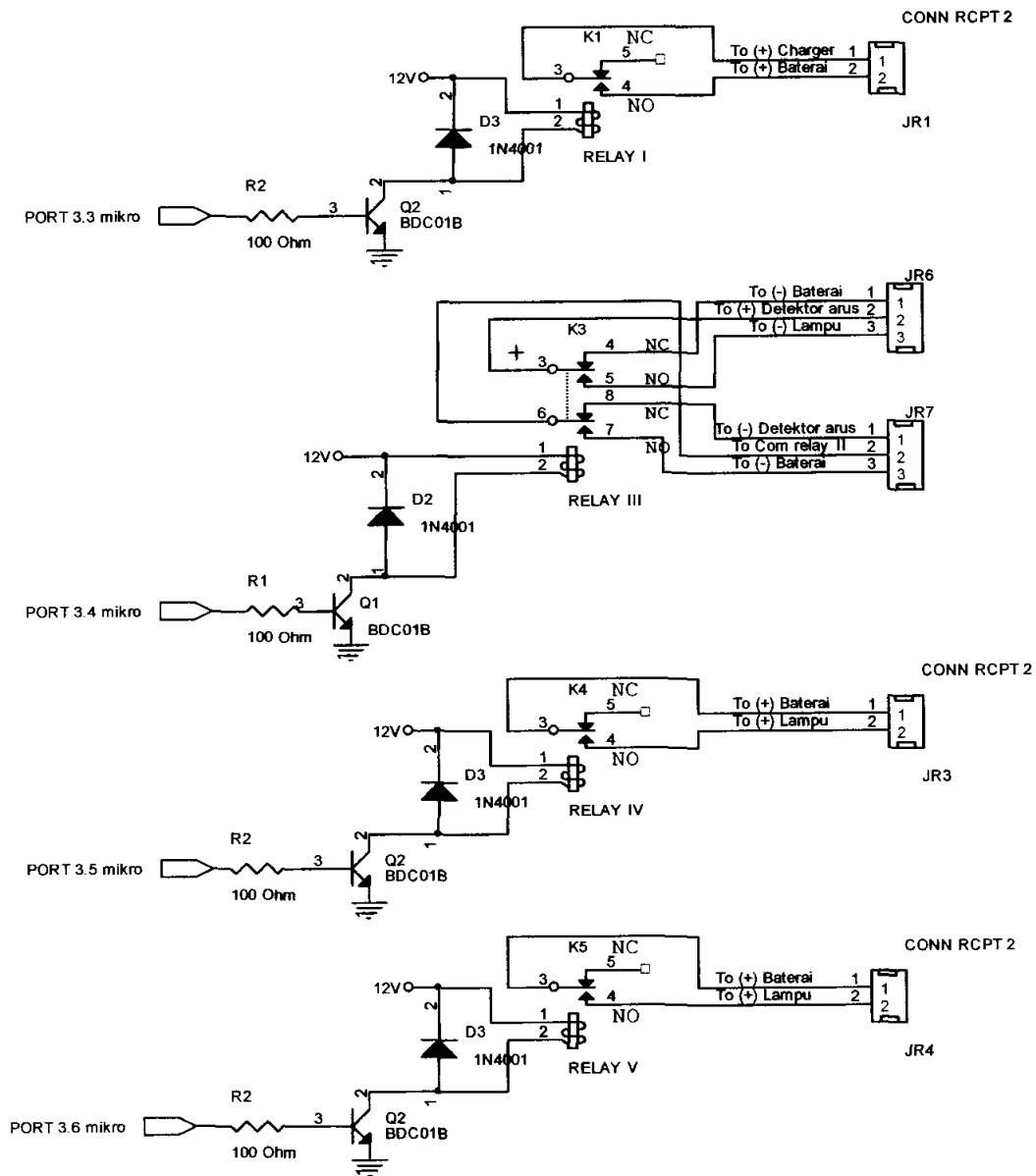


# Lampiran 4

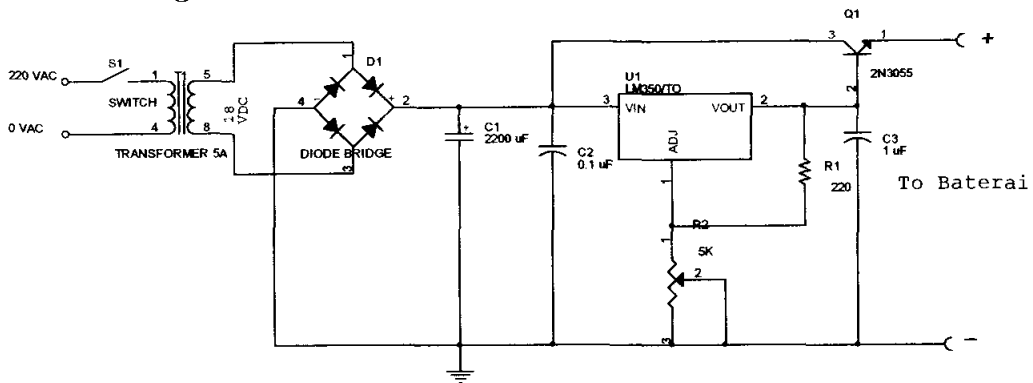
- Skema Alat Pengecekan Kapasitas Aki



● Skema Switch Otomatis



• **Skema Charger**



• **Skema Catu Daya**

