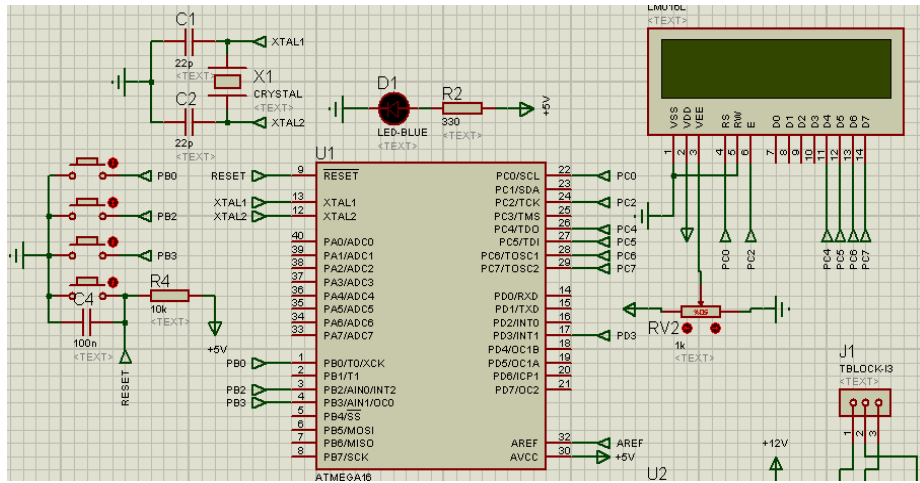


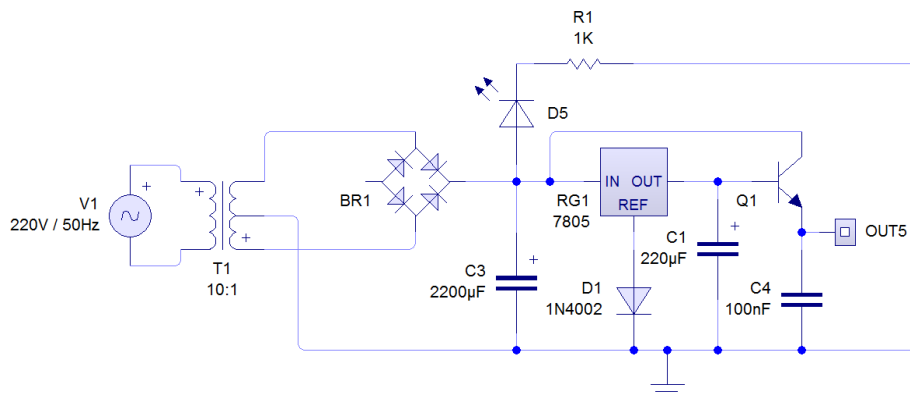
## LAMPIRAN

### 1. Pembuatan rangkaian *power supply* dan *minimum sistem*

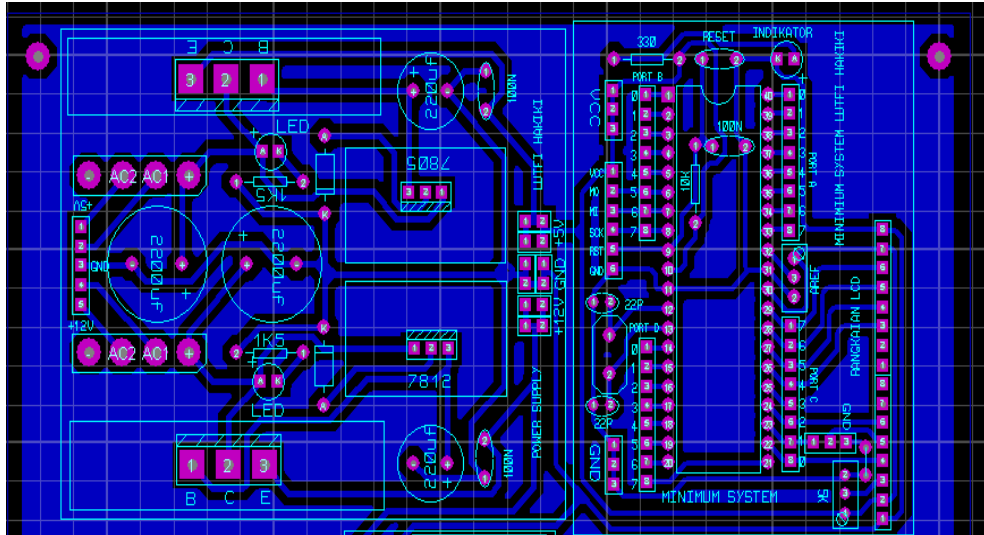


Rangkaian simulasi atmega16 pada program proteus isis

### 2. Rangkaian Power suply 5V



### 3. Layout

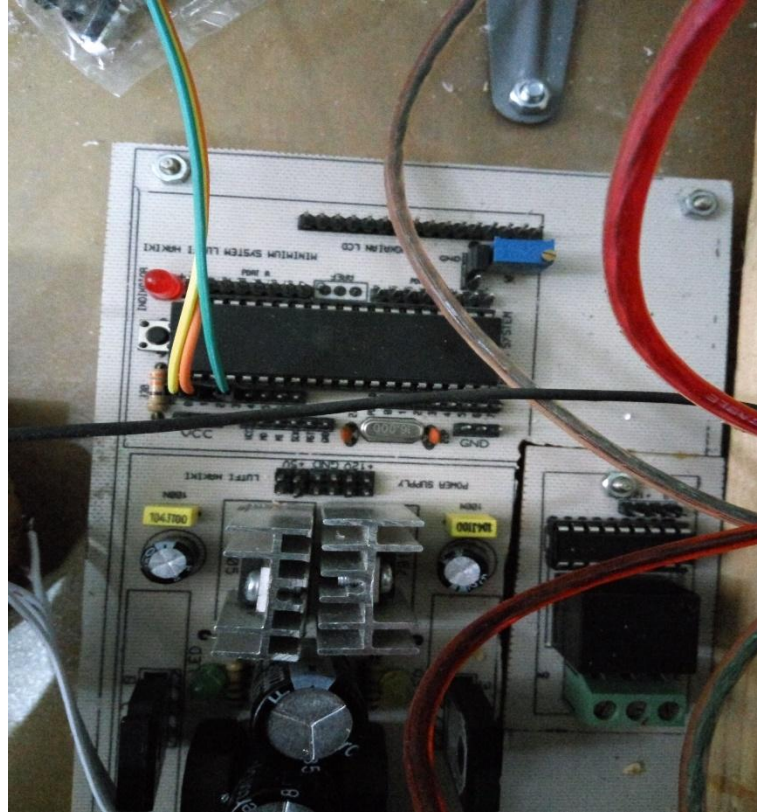


Layout power supply dan minimum sistem

### 4. Rangkaian power supply dan minimum sistem pada papan PCB



## 5. Rangkaian pada modul



## 6. Proses pembuatan *box* menggunakan akrilik dan alumunium



## 7. Proses Pembuatan Kontrol Waktu



## 8. Pembuatan Program Timer Menggunakan Bascom AVR

```
BASCOM-AVR IDE (2.0.7.5) - I:\program\program.bas
File Edit View Program Tools Options Window Help
program.bas
Sub Label
$regfile = "atmega161.dat"
$crystal = 16000000
Lampu Alias PORTD.3
Up Alias PORTE.0
Down Alias PORTE.2
Enter Alias PORTB.3
PORTB = $HEX
DORS = $HEX
DORS3 = 1
Config Lcdpin = Pin R# = PORTC.0 , E = PORTC.2 , Db4 = PORTC.4
Config Lcdpin = Pin D#5 = PORTC.5 , Db6 = PORTC.6 , Db7 = PORTC.7
Config Lcd = 16 * 2
Cursor Off
Cls
Config TIMER1 = Timer , Prescale = 1024
Config PORTB = Input
Dim Isi As Byte , Sec As Integer , Speed As Word , Menit As Byte
Dim Suhu As Integer , Tempil As Integer , Start As Long , V As Integer
Dim Volt As Integer , Sec_ As Byte , V As Integer
Isi = 0
Menit = 4
Start = 0
Sec = 59
Lampu = 0
Locate 1 , 2
Lcd "TUGAS AKHIR TEM"
Waitms 2000
Cls
Locate 1 , 2
Lcd "TEMPERATUR"
Locate 2 , 2
Lcd "INFRARED"
Waitms 2000
Cls
Locate 1 , 2
Lcd "IHTI HAKIKI"
Waitms 2000
Cls
Do
If PINB.3 = 0 Then
'pengaturan Awal Waktu **
'program Untuk Mengukur Atau Mengkondisikan Prosesnya Dalam Kon
'pengaturan Awal Secan Untuk Perhitungan Mundur **

```

```

BASIC-AVR IDE [2.0.7.5] - [F:\program\program.bas]
File Edit View Program Tools Options Window Help
program.bas
Sub
Label
Waitms 2000
CIR
Do
If PINB 3 = 0 Then
Incr Isi
Waitms 24
End If

If PINB 0 = 0 AND Isi = 1 Then
Menit = Menit + 5
End If

If PINB 2 = 0 AND Isi = 1 Then
Menit = Menit - 5
CIR
End If

If Isi = 2 Then
Lampu = 1
Gosub Mula1
End If
Waitms 24

Locate 1 , 4
Lcd "Timer"

Locate 2 , 4
Lcd : Menit : " : " : Sec_ : " : "

Waitms 24

Loop
Mula1:
Lampu = 1
Locate 1 , 4
Lcd "Timer"

Locate 2 , 4
Lcd : Menit : " : " : Sec_ : " : "

```

```

BASIC-AVR IDE [2.0.7.5] - [F:\program\program.bas]
File Edit View Program Tools Options Window Help
program.bas
Sub
Label
Lcd : Menit : " : " : Sec_ : " : "

If Start_ = 00 Then
Gosub Start_timer
End If

If Sec_ <= 10 Then
Locate 2 , 4
Lcd : Menit : " : " : Sec_ : " : "
End If

If Sec_ <= 0 Then
Decr Menit
Sec_ = 59
End If

If Menit = 0 AND Sec_ <= 1 Then
Gosub Berhenti
End If

Return
Start_timer: Decr Sec_
Waitms 540

Return
Berhenti:
CIR
Locate 2 , 2
Lcd "FINISH"
Lampu = 0
Menit = 1
Sec_ = 1
Wait 200
Return

```

## 9. Penghitungan Data

Analisa Perhitungan *Timer* 5 menit

a. Rata-Rata ( $\bar{X}$ )

Dirumuskan sebagai berikut :

$$\bar{X} = \frac{\sum X(n)}{n}$$

$$5+5+5+5+5,1+5+5+5+5+5$$

$$\bar{X} = \frac{4,59+5+5+5,1+5+5+5+5+4,59}{20}$$

$$\bar{X} = 4,969$$

**b. Error (%)**

Dirumuskan sebagai berikut :

$$\% \text{ Error} = \frac{X_n - \bar{X}}{X_n} \times 100\%$$

$$\% \text{ Error} = \frac{5 - 4,969}{5} \times 100\%$$

$$\% \text{ Error} = 0,62\%$$

**Percobaan 10 menit**

**a. Rata-Rata ( $\bar{X}$ )**

Dirumuskan sebagai berikut :

$$\bar{X} = \frac{\sum X(n)}{n}$$

$$\bar{X} = \frac{10+10,2+10+9,59+10,1+10+10+10,1+10,2+10+9,59+10+10+10,1+10+10+10+10,1+10+9,58}{20}$$

$$\bar{X} = 9,978$$

**b. Error (%)**

Dirumuskan sebagai berikut :

$$\% \text{ Error} = \frac{X_n - \bar{X}}{X_n} \times 100\%$$

$$\% \text{ Error} = \frac{10 - 9,978}{10} \times 100\%$$

$$\% \text{ Error} = 0,22\%$$

