

LAMPIRAN

'=====BISMILLAHIRRAHMANIRRAHIM=====

\$regfile = "m32def.dat"
\$crystal = 11059200
\$baud = 9600

'=====VARIABLE_ADC=====

Dim A As Word
Dim Be As Single
Dim C As Single
Dim D As Word
Dim Pv As Single

Deflcdchar 0 , 12 , 18 , 18 , 12 , 32 , 32 , 32 , 32

'=====VARIABLE_JST=====

Dim Zin_a(25) As Single , Zin_b(25) As Single , Zin_c(25) As Single , Zin_d(25) As Single , Zin_e(25) As Single ,
Zin_f(25) As Single , Zin_(25) As Single
Dim Zin_a4 As Single , Zin_b4 As Single , Zin_c4 As Single , Zin_d4 As Single , Zin_e4 As Single , Zin_f4 As
Single , Zin_4 As Single
'Dim Zin_(25)_new As Single , Zin_1_new As Single , Zin_2_new As Single , Zin_3_new As Single , Zin_4_new
As Single ,
Dim Zin_new_(25) As Single
Dim Zin_total As Single , Zin_total1 As Single , Zin_total2 As Single , Zin_total3 As Single , Zin_total4 As Single ,
Zin_total5 As Single
Dim Zin_total6 As Single , Zin_total7 As Single , Zin_total8 As Single , Zin_total9 As Single , Zin_total10 As
Single
Dim Zin_total11 As Single , Zin_total12 As Single , Zin_total13 As Single , Zin_total14 As Single , Zin_total15 As
Single
Dim Zin_total16 As Single , Zin_total17 As Single , Zin_total18 As Single , Zin_total19 As Single , Zin_total20 As
Single
Dim Zin_total_logsig1 As Single , Zin_total_logsig2 As Single , Zin_total_logsig3 As Single , Zin_total_logsig4 As
Single , Zin_total_logsig5 As Single
Dim X As Single , Y As Single , Setpoint As Single
Dim Esetpoint As Eram Single , Time_esetpoint As Eram Single
Dim J As Word , Control As Word , Saturasi_min As Single , Saturasi_maxx As Single , Control_min As Word ,
Control_maxx As Word
Dim K As Integer , Sign As Bit
Dim W(25) As Single , W4 As Single , W1(25) As Single , W11 As Single , W22 As Single , W33 As Single , W44
As Single
Dim B(25) As Single , B4 As Single , B5 As Single , B11 As Single
Dim Y_min As Single , Y_max As Single , X_min_dsuhu As Single , X_max_dsuhu As Single , X_min_teg As
Single , X_max_teg As Single
Dim X_norm_fix As Single , X_norm_a As Single , X_norm_b As Single , X_norm_c As Single , X_norm_d As
Single , X_norm_e As Single , X_norm_f As Single
Dim Y_denorm_fix As Single , Y_denorm_a As Single , Y_denorm_b As Single , Y_denorm_c As Single ,
Y_denorm_d As Single , Y_denorm_e As Single , Y_denorm_f As Single
Dim Potensio As Word
Dim I As Byte , Z As Byte
Dim Ssetpoint As Single

'=====SETTING_LCD=====

Config Lcdpin = Pin , Db4 = Portc.4 , Db5 = Portc.5 , Db6 = Portc.6
Config Lcdpin = Pin , Db7 = Portc.7 , E = Portc.2 , Rs = Portc.0
Config Lcd = 16 * 2
Cursor Off

```
'=====SETTING_ADC=====
Config Adc = Single , Prescaler = Auto , Reference = Avcc
```

```
'=====SETTING_PWM=====
Config Timer1 = Pwm , Pwm = 8 , Compare A Pwm = Clear Up , Prescale = 1
```

```
'=====SETTING_TIMER=====
Dim S As Word , Men As Word , Det As Byte
Dim F_waktu As Bit
```

```
'=====KONTANTA=====
Const E = 2.71
```

```
'=====SUBRUTIN=====
Declare Sub Jst
Declare Sub Cekin
Declare Sub Set_time
Declare Sub Seting
Declare Sub Keypad
Declare Sub Entri
Declare Sub Baca_sensor
Declare Sub Hitung_jst
Declare Sub Waktu
```

```
'=====TOMBOL=====
Config Pind.0 = Input
Set Portd.0
Config Pind.1 = Input
Set Portd.1
Config Pind.2 = Input
Set Portd.2
Config Pind.3 = Input
Set Portd.3

Tombol1 Alias Pind.0
Tombol2 Alias Pind.1
Tombol3 Alias Pind.2
Tombol4 Alias Pind.3
```

```
'=====VARIABEL_KEYPAD=====
Dim Selesai As Bit , Masuk As Byte , Angka As Byte
Dim Ps As Word
Dim Menu As Byte , Spt As Single , Spp As Single , Sps As Single
Dim Sstart As Bit
```

```
Ddrb = &B00000111
Portb = &HFF
```

```
'=====PARAMETER_JST=====
Saturasi_min = 0.00
Saturasi_maxx = 10.00
Control_min = 0
Control_maxx = 255
```

Y_min = 0
Y_max = 1
X_min_dsuhu = -201.00
X_max_dsuhu = 300.00
X_min_teg = 0.00
X_max_teg = 251.00

W(1) = 55.7885
W(2) = -57.4058
W(3) = -56.2180
W(4) = 55.9633
W(5) = -56.0150
W(6) = 55.9353
W(7) = 55.9086
W(8) = 56.0620
W(9) = -55.9818
W(10) = -55.9986

W1(1) = 0.8987
W1(2) = 1.3950
W1(3) = -2.6395
W1(4) = -0.2894
W1(5) = 0.1902
W1(6) = 1.0048
W1(7) = -1.0620
W1(8) = 2.0224
W1(9) = -0.0764
W1(10) = 1.0605

B(1) = -56.2115
B(2) = 48.1735
B(3) = 43.3975
B(4) = -37.3915
B(5) = 31.0675
B(6) = -25.2214
B(7) = -18.9053
B(8) = -12.1579
B(9) = 6.3914
B(10) = -2.1733
B11 = -0.9612

Start Adc

Awal:
Cls
Pwm1a = 0
Upperline
Lcd "<<<BISMILLAH>>>"
Wait 2
Cls
Upperline
Lcd "Presented By:"
Wait 1

Locate 2 , 15
Lcd "I"
Waitms 500
Locate 2 , 14
Lcd "D"
Waitms 500
Locate 2 , 13
Lcd "A"
Waitms 500
Locate 2 , 12
Lcd "Y"
Waitms 500
Locate 2 , 11
Lcd "H"
Waitms 500
Locate 2 , 10
Lcd "A"
Waitms 500
Locate 2 , 9
Lcd "C"
Waitms 500
Locate 2 , 8
Lcd "S"
Waitms 500
Locate 2 , 7
Lcd "I"
Waitms 500
Locate 2 , 5
Lcd "N"
Waitms 500
Locate 2 , 4
Lcd "A"
Waitms 500
Locate 2 , 3
Lcd "Y"
Waitms 500
Locate 2 , 2
Lcd "A"
Waitms 500
Locate 2 , 1
Lcd "Y"
Wait 1

'=====MULAI=====

Do
Mulai:

Cls
Upperline
Lcd "1.GO ||| 2.SET "
Locate 2 , 6
Lcd "4.RST"

If Tombol1 = 0 Then
Waitms 100
Bitwait Tombol1 , Set

```
Call Jst  
End If
```

```
If Tombol2 = 0 Then  
Waitms 100  
Bitwait Tombol2 , Set  
Call Seting  
End If
```

```
If Tombol3 = 0 Then  
Waitms 100  
Bitwait Tombol3 , Set  
Call Set_time  
Goto Mulai  
End If
```

```
If Tombol4 = 0 Then  
Waitms 100  
Bitwait Tombol4 , Set  
'Selesai = 1  
Exit Do  
'Goto Awal  
Waitms 100  
End If
```

```
Waitms 500
```

```
Loop
```

```
Goto Awal
```

```
'=====SUB_SETTING=====
```

```
Sub Seting:  
Menu = 1  
Cls  
Upperline  
Lcd "SP = "  
Locate 1 , 9  
Lcd Chr(0) ; "C"  
Lowerline  
Lcd "1.OK >>>>>>>>>>>>>>>"  
Waitms 400
```

```
Ps = 0  
Call Keypad  
Sps = Ps  
Esetpoint = Sps
```

```
End Sub
```

```
'=====SUB_SETTING=====
```

```
Sub Set_time:  
Menu = 2  
Cls  
Upperline  
Lcd "TIMER = "
```

```
Locate 1 , 12
Lcd "Menit"
Lowerline
Lcd "1.OK >>>>>>>>>>>>>>>"
Waitms 400
```

```
Ps = 0
Call Keypad
Spt = Ps
Time_esetpoint = Spt
```

End Sub

```
'===== Baca_SENSOR =====
```

Sub Baca_sensor:

```
A = Getadc(0)
Be = A * 1.1194
C = Be - 75.4894
D = C
'Cls
```

End Sub

```
'===== JST_UTAMA =====
```

Sub Jst:

```
Do
Cls
```

```
Locate 2 , 15
Lcd ">>"
Locate 1 , 1
Lcd "SP="
Locate 1 , 10
Lcd "|CV="
```

Call Baca_sensor

```
Locate 2 , 1
Lcd "PV=" ; D ; Chr(0) ; "C"
Print "S " ; D
```

Call Hitung_jst

```
Locate 1 , 4
Lcd Setpoint ; Chr(0)
Locate 1 , 14
Lcd Control
Print "T " ; Control
```

```
'Call Waktu
'Locate 2 , 9
'Lcd "|" ; Men ; ":" ; Det
```

```

=====
If Tombol4 = 0 Then
Waitms 100
Bitwait Tombol4 , Set
Exit Do
Gosub Mulai
Waitms 100
End If

Waitms 100
Loop

End Sub

=====

Sub Hitung_jst:

Setpoint = Esetpoint

Pv = D
X = Setpoint - Pv
Print "U " ; X

'-----NORMALISASI-----
X_norm_a = Y_max - Y_min
X_norm_b = X - X_min_dsuhu
X_norm_c = X_max_dsuhu - X_min_dsuhu
X_norm_d = X_norm_c + Y_min
X_norm_e = X_norm_a * X_norm_b
X_norm_f = X_norm_e / X_norm_d
X_norm_fix = X_norm_f

For I = 1 To 10
'=====NEURON_1=====
Zin_a(i) = X_norm_fix * W(i)
Zin_b(i) = Zin_a(i) + B(i)
'=====logsig=====
Zin_c(i) = -1 * Zin_b(i)
Zin_d(i) = E ^ Zin_c(i)
Zin_e(i) = 1 + Zin_d(i)
Zin_f(i) = 1 / Zin_e(i)
Zin_(i) = Zin_f(i)
'=====
Next

For Z = 1 To 10
'=====
Zin_new_(z) = Zin_(z) * W1(z)
Next

'=====TOTAL_Zin=====
Zin_total1 = Zin_new_(1) + Zin_new_(2)
Zin_total2 = Zin_total1 + Zin_new_(3)

```



```

Zin_total3 = Zin_total2 + Zin_new_(4)
Zin_total4 = Zin_total3 + Zin_new_(5)
Zin_total5 = Zin_total4 + Zin_new_(6)
Zin_total6 = Zin_total5 + Zin_new_(7)
Zin_total7 = Zin_total6 + Zin_new_(8)
Zin_total8 = Zin_total7 + Zin_new_(9)
Zin_total9 = Zin_total8 + Zin_new_(10)
Zin_total10 = Zin_total9 + B11
Zin_total = Zin_total10

```

```

'=====logsig=====
Zin_total_logsig1 = -1 * Zin_total
Zin_total_logsig2 = E ^ Zin_total_logsig1
Zin_total_logsig3 = 1 + Zin_total_logsig2
Zin_total_logsig4 = 1 / Zin_total_logsig3

```

```

'=====OUTPUT=====
Y = Zin_total_logsig4

```

```

'-----DENORMALISASI-----
Y_denorm_a = X_max_teg - X_min_teg
Y_denorm_b = Y_denorm_a + Y_min
Y_denorm_c = Y * Y_denorm_b
Y_denorm_d = Y_max - Y_min
Y_denorm_e = Y_denorm_c / Y_denorm_d
Y_denorm_f = Y_denorm_e + X_min_teg
Y_denorm_fix = Y_denorm_f

```

```

'=====SATURASI=====

```

```

'If X < Saturasi_min Then
'Y_denorm_fix = Control_min

```

```

'End If

```

```

'=====OUTPUT_CONTROL=====
Control = Y_denorm_fix + 30.00
Pwm1a = Control

```

```

'If X <= 29 And X >= 4then
'Control = 120
'End If

```

```

If X <= 3 And X > 0 Then
Control = 105
End If

```

```

If X <= 0 And X >= -1 Then
Control = 98
End If

```

```

If X <= -2 Then
Control = 30
End If

```

End Sub

'=====KEYPAD=====

Sub Keypad:

Do

Portb = &B1111110

If Pinb.6 = 0 Then 'tombol 3' '

Waitms 400

Angka = 3

Call Entri

Elseif Pinb.5 = 0 Then 'tombol 6 '

Waitms 400

Angka = 6

Call Entri

Elseif Pinb.4 = 0 Then ' Tombol 9 '

Waitms 400

Angka = 9

Call Entri

Elseif Pinb.3 = 0 Then 'tombol #'

Selesai = 1

End If

Portb = &B1111101

If Pinb.6 = 0 Then 'tombol 2'

Waitms 400

Angka = 2

Call Entri

Elseif Pinb.5 = 0 Then 'tombol 5'

Waitms 400

Angka = 5

Call Entri

Elseif Pinb.4 = 0 Then ' Tombol 8 '

Waitms 400

Angka = 8

Call Entri

Elseif Pinb.3 = 0 Then 'tombol 0 '

Waitms 400

Angka = 0

Call Entri

End If

Portb = &B1111011

If Pinb.6 = 0 Then 'tombol 1' '

Waitms 400

Angka = 1

Call Entri

Elseif Pinb.5 = 0 Then 'tombol 4 '

Waitms 400

Angka = 4

Call Entri

Elseif Pinb.4 = 0 Then ' Tombol 7 ''''

Waitms 400

Angka = 7

Call Entri

```
Elseif Pinb.3 = 0 Then          'tombol * '  
'Selesai = 1  
End If
```

```
If Tombol1 = 0 Then  
Waitms 100  
Bitwait Tombol1 , Set  
Selesai = 1  
End If
```

```
Loop Until Selesai = 1  
Selesai = 0  
Masuk = 0
```

```
End Sub
```

```
'=====ENTRI=====
```

```
Sub Entri:  
Incr Masuk  
If Masuk = 1 Then  
    Ps = Angka  
Elseif Masuk = 2 Then  
    Ps = Ps * 10  
    Ps = Ps + Angka  
Elseif Masuk = 3 Then  
    Ps = Ps * 10  
    Ps = Ps + Angka  
End If  
If Menu = 1 Then  
Locate 1 , 6  
Lcd Ps  
Elseif Menu = 2 Then  
Locate 1 , 9  
Lcd Ps  
Elseif Menu = 3 Then  
Locate 1 , 8  
Lcd Ps  
End If  
End Sub
```

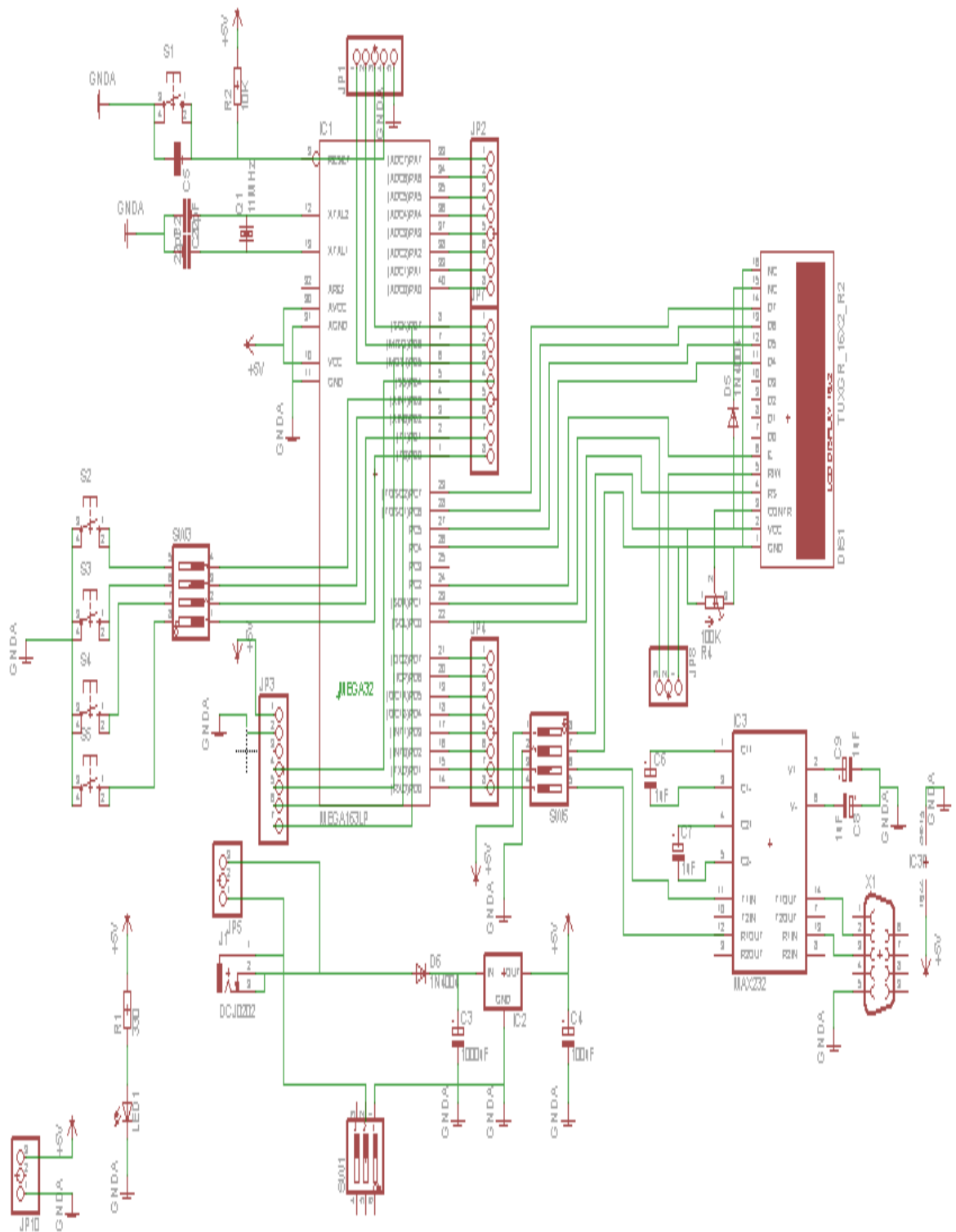
```
'=====TIMER=====
```

```
Sub Waktu:  
'Do  
    Det = 0  
    For S = 0 To 59  
        Incr Det  
        Wait 1  
  
        If Det = 59 Then  
            Incr Men  
            End If  
  
        Next  
  
    ' Loop  
End Sub
```

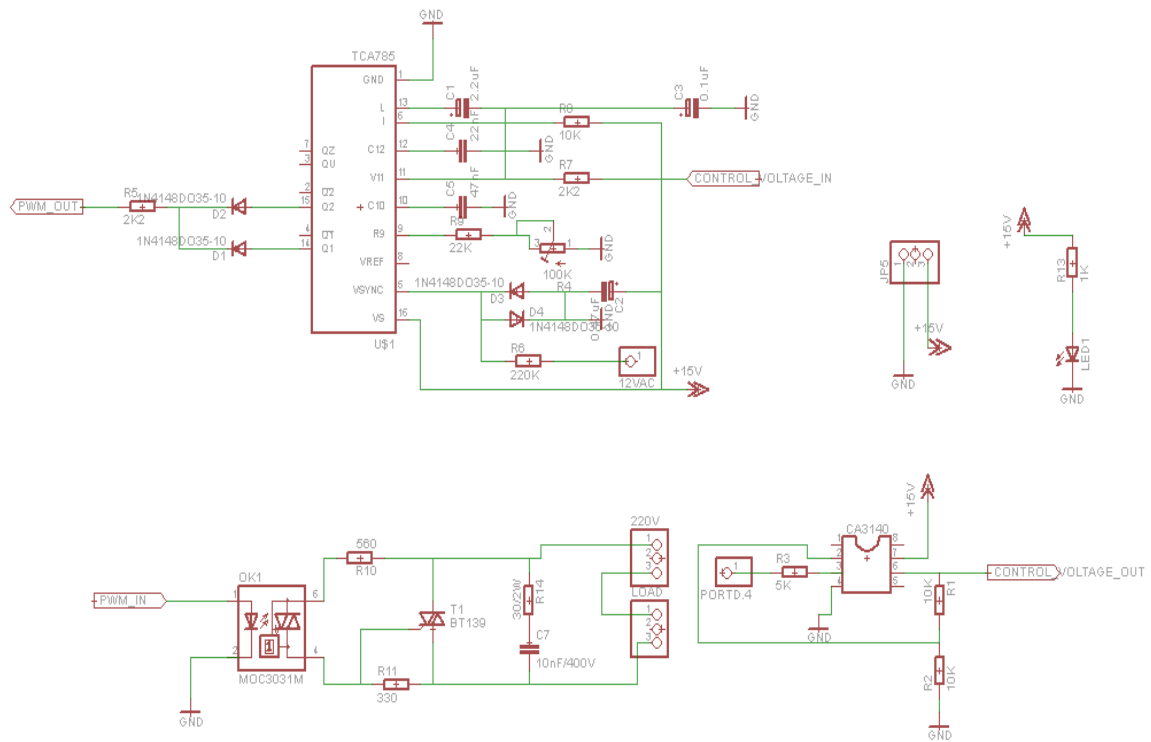
FOTO IMPLEMENTASI *HARDWARE*



RANGKAIAN SISTEM MINIMUM



RANGKAIAN DRIVER AC



RANGKAIAN PENGKONDISI SINYAL TERMOKOPEL

