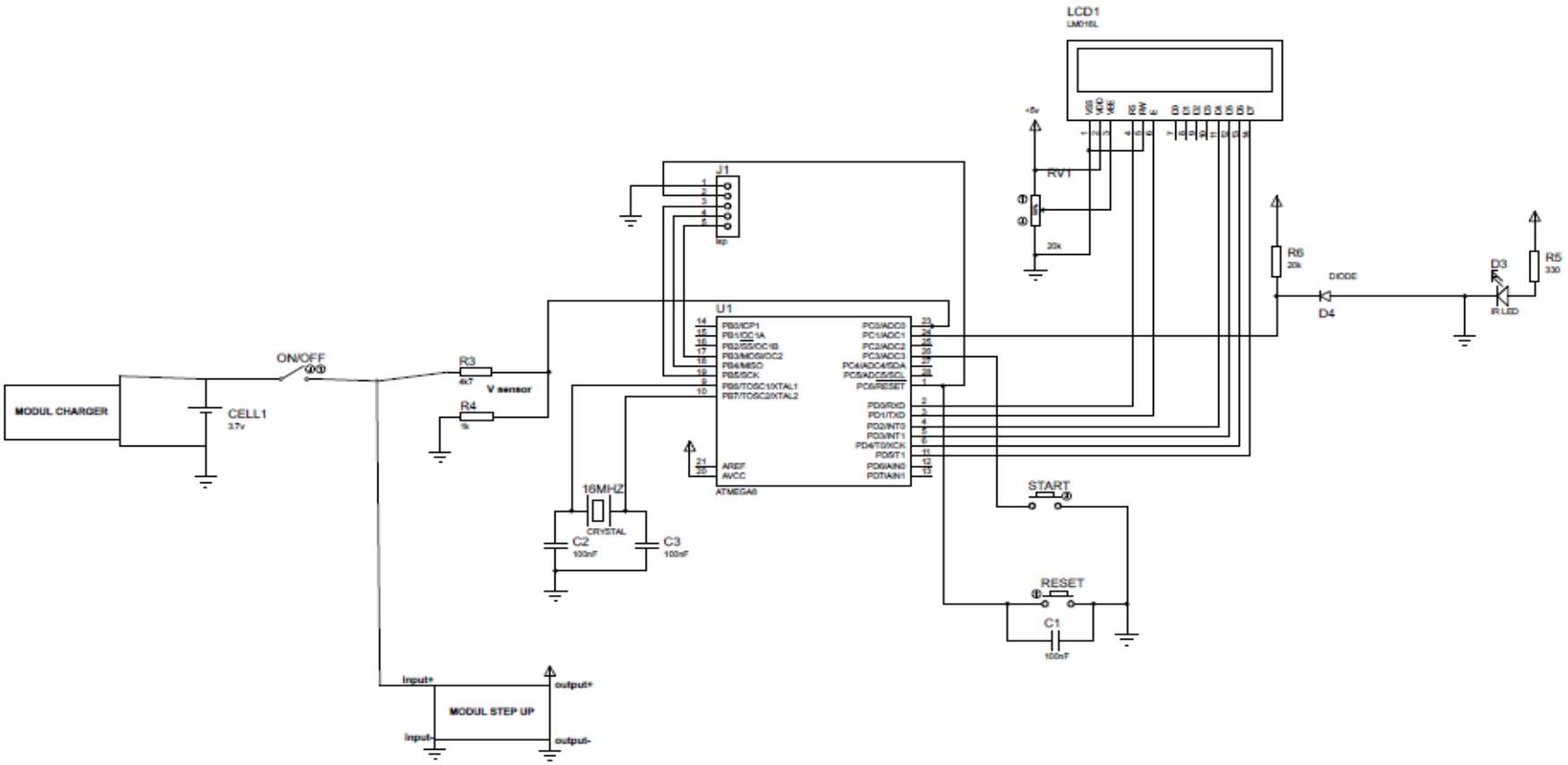
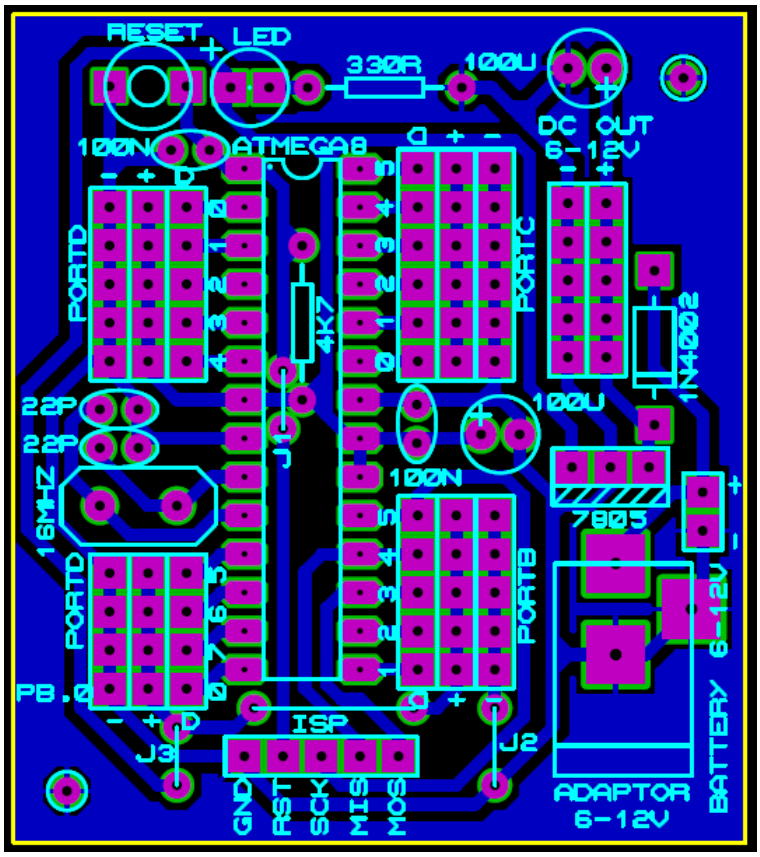
LAMPIRAN

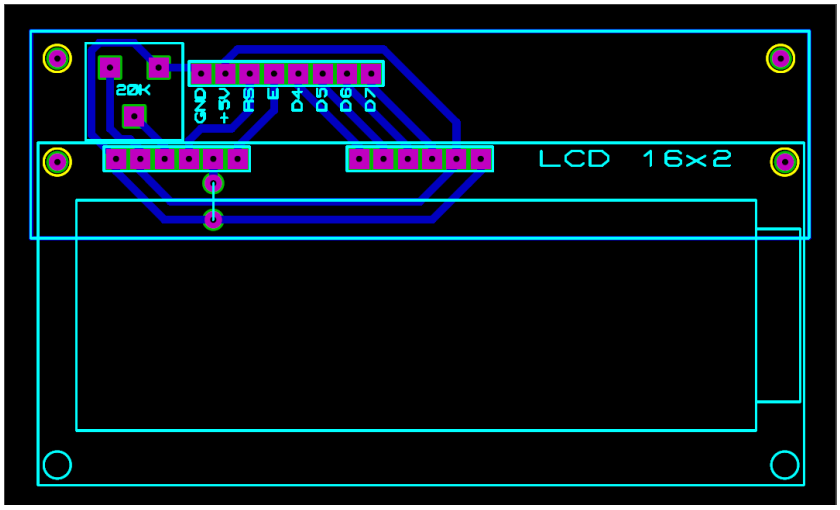

LCD1
LM016L
RV1
20k
J1
Header 5
U1
ATMEGA8
ON/OFF
MODUL CHARGER
CELL1
3.7v
R3
4k7
V sensor
R4
1k
16MHZ
CRYSTAL
C2
100nF
C3
100nF
START
RESET
C1
100nF
R6
20k
DIODE
D4
D3
IR LED
R5
330
MODUL STEP UP
Input+
Input-
output+
output-

Layout PCB

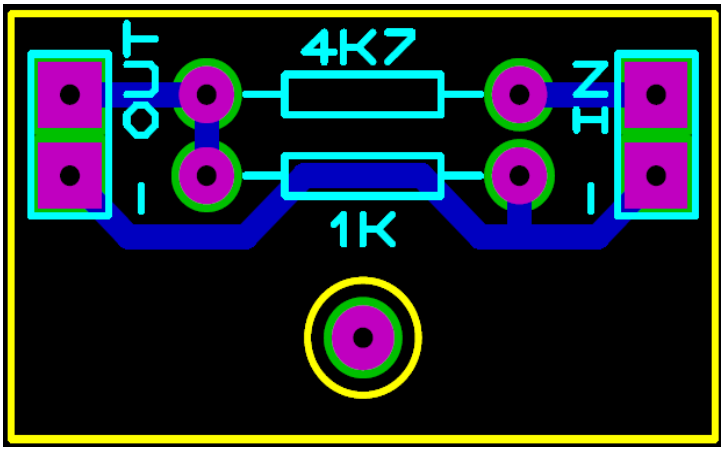
- Layout Minimum Sistem dengan ATMega8



- Layout LCD



- Layout Pembagi Tegangan



List Program

```
#include <mega8.h> //preprocessor menyertakan library
IC Atmega8

#include <stdio.h>

#include <delay.h>//preprocessor menyertakan library
delay

#include <alcd.h> // preprocessor menyertakan library
LCD

#define ADC_VREF_TYPE 0x40 // fungsi otomatis
pembacaan library ADC dari wizard


#define tombol PINC.5

#define vbat        0

#define sensor      1


char buff[33];
```

```
unsigned int read_adc(unsigned char adc_input)

{

ADMUX=adc_input | (ADC_VREF_TYPE & 0xff);

// Delay needed for the stabilization of the ADC
input voltage

delay_us(10);
```

```
volt=adc*((float)5/1023);  // mengubah nilai adc ke tegangan
 voltout=volt*((float)involtmax/voltmax); // mengubah nilai
tegangan kecil ke tegangan sensor
return voltout;
}
int timer=0;


float sensorir(){
float data;
int xadc = read_adc(sensor);
data = xadc*((float)5/1023);  // mengubah nilai adc ke tegangan
return data;
```

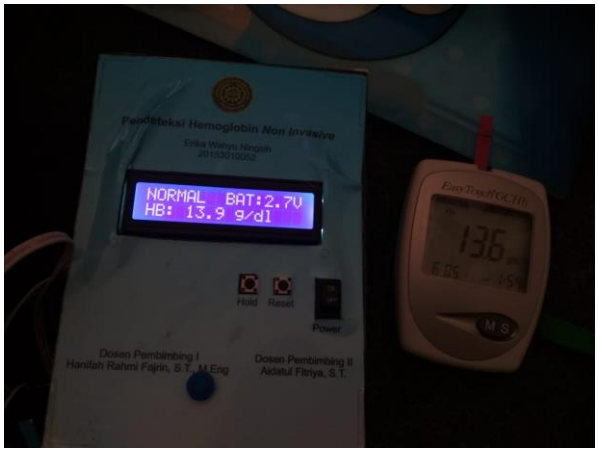
```
if(tombol == 0) lock=1;
if(lock==0){
lcd_clear();
lcd_gotoxy(0,0);
//sprintf(buff,"BAT:%.1fV ",xvbat);
sprintf(buff," BAT:%.1fV ",xvbat);
if(hb>=10.0 && hb<=15.0)lcd_putsf("NORMAL ");
if(hb>15.0)lcd_putsf("HIGH ");
if(hb<10.0)lcd_putsf("LOW ");


lcd_puts(buff);
```

```
void main(void)
{
lcd_init(16);
lcd_clear();
lcd_gotoxy(0,0);
lcd_putsf("ERIKA");
lcd_gotoxy(0,1);
lcd_putsf("HB Tester");
delay_ms(1000);

while (1)
      {
      // Place your code here
      cek_hb();
      }
}
```

LAMPIRAN FOTO



Perhitungan Statistik

A. Rata-rata (Mean) Nilai dari modul

$$\bar{x} = \frac{\sum x_n}{n}$$

1. $\bar{x} = \frac{13{,}2+13{,}0+12{,}9}{3}$

   = 13,1

2. $\bar{x} = \frac{14{,}7+14{,}5+14{,}8}{3}$

   = 14,7

3. $\overline{X} = \frac{13,0+12,9+13,2}{3}$

   = 13,0

4. $\overline{X} = \frac{14,7+15,0+15,2}{3}$

   = 15,0

5. $\overline{X} = \frac{14,2+14,7+15,0}{3}$

   = 14,6

6. $\overline{X} = \frac{12,9+12,8+13,0}{3}$

   = 12,9

7. $\overline{X} = \frac{13,1+13,2+13,0}{3}$

   = 13,1

8. $\overline{X} = \frac{14,7+14,7+13,2}{3}$

   = 14,2

9. $\overline{X} = \frac{11,8+11,2+11,8}{3}$

   = 11,6

10. $\overline{X} = \frac{11,2+11,2+11,4}{3}$

    = 11,2

B. Simpangan dari data modul TA terhadap nilai pembanding

$$\text{simpangan} = x_n - \bar{x}$$

1. Nilai hemoglobin alat pembanding = 13,2 g/dl

Rata-rata nilai modul = 13,1 g/dl

- Simpangan = 13,2 – 13,1
  = 0,1

2. Nilai hemoglobin alat pembanding = 14,1 g/dl

   Rata-rata nilai modul = 14,7 g/dl

   - Simpangan = 14,1 – 14,7
     = -0,6

3. Nilai hemoglobin alat pembanding = 12,7 g/dl

   Rata-rata nilai modul = 13,0 g/dl

   - Simpangan = 12,7 – 13,0
     = -0,3

4. Nilai hemoglobin alat pembanding = 15,7 g/dl

   Rata-rata nilai modul = 15,0 g/dl

   - Simpangan = 15,7 – 15,0
     = 0,7

5. Nilai hemoglobin alat pembanding = 15,6 g/dl

   Rata-rata nilai modul = 14,6 g/dl

   - Simpangan = 15,6 – 14,6
     = 1

6. Nilai hemoglobin alat pembanding = 12,8 g/dl

   Rata-rata nilai modul = 12,9 g/dl

   - Simpangan = 12,8 – 12,9
     = -0,1

7. Nilai hemoglobin alat pembanding = 12,8 g/dl

   Rata-rata nilai modul = 13,1 g/dl

- Simpangan = 12,8 – 12,1

  = -0,3

8. Nilai hemoglonin alat pembanding = 14,5 g/dl

   Rata-rata nilai modul = 14,2 g/dl

   - Simpangan = 14,5 – 14,2

     = 0,3

9. Nilai hemoglonin alat pembanding = 11,5 g/dl

   Rata-rata nilai modul = 11,6 g/dl

   - Simpangan = 11,5 – 11,6

     = -0,1

10. Nilai hemoglonin alat pembanding = 10,8 g/dl

    Rata-rata nilai modul = 11,2 g/dl

    - Simpangan = 10,8 – 11,2

      = -0,4

C. Presentase Error (%)

$$\text{Persentase Error} = \frac{\text{simpangan}}{x_n} \text{ x } 100\%$$

1. $\text{Persentase Error} = \frac{0,1}{13,2} \text{ x } 100\%$

   = 0,8 %

2. $\text{Persentase Error} = \frac{-0,6}{14,1} \text{ x } 100\%$

   = -4,3 %

3. $\text{Persentase Error} = \frac{-0,3}{12,7} \text{ x } 100\%$

   = -2,4 %

4. $\text{Persentase Error} = \frac{0,7}{15,7} \text{ x } 100\%$

= 4,5 %

5. Persentase Error = $\frac{1}{15,6}$ x 100%

   = 6,4 %

6. Persentase Error = $\frac{-0,1}{12,6}$ x 100%

   = -0,8 %

7. Persentase Error = $\frac{-0,3}{12,8}$ x 100%

   = -2,3 %

8. Persentase Error = $\frac{0,3}{14,5}$ x 100%

   = 2,1 %

9. Persentase Error = $\frac{-0,1}{11,5}$ x 100%

   = -0,9 %

10. Persentase Error = $\frac{-0,4}{10,8}$ x 100%

    = -3,7 %

D. Standart Deviasi

$$SD = \frac{\sqrt{\sum(x_1-\bar{x})^2 + (x_2-\bar{x})^2 + \cdots + (x_n-\bar{x})^2}}{n-1}$$

dengan :

SD = Standar Deviasi

x = Data x

$\bar{x}$ = Rata-rata

n = Banyak data

1. $SD = \frac{\sqrt{\sum(13,2-13,1)^2+(13,0-13,1)^2+(12,9-13,1)^2}}{3-1}$

   $= 0,173$

2. $SD = \frac{\sqrt{\sum(14,7-14,7)^2+(14,5-14,7)^2+(14,8-14,7)^2}}{3-1}$

   $= 0,158$

3. $SD = \frac{\sqrt{\sum(13,0-13,0)^2+(12,9-13,0)^2+(13,2-13,0)^2}}{3-1}$

   $= 0,158$

4. $SD = \frac{\sqrt{\sum(14,7-15,0)^2+(15,0-15,0)^2+(15,2-15,0)^2}}{3-1}$

   $= 0,254$

5. $SD = \frac{\sqrt{\sum(14,2-14,6)^2+(14,7-14,6)^2+(15,0-14,6)^2}}{3-1}$

   $= 0,41$

6. $SD = \frac{\sqrt{\sum(12,9-12,9)^2+(12,8-12,9)^2+(13,0-12,9)^2}}{3-1}$

   $= 0,1$

7. $SD = \frac{\sqrt{\sum(13,1-13,1)^2+(13,2-13,1)^2+(13,0-13,1)^2}}{3-1}$

   $= 0,1$

8. $SD = \frac{\sqrt{\sum(14,7-14,2)^2+(14,7-14,2)^2+(13,2-14,7)^2}}{3-1}$

   $= 0,86$

9. $SD = \frac{\sqrt{\sum(11,5-11,6)^2+(11,2-11,6)^2+(11,8-11,6)^2}}{3-1}$

   $= 0,436$

10. $SD = \frac{\sqrt{\sum(11,2\text{-}10,8)^2+(11,2\text{-}10,8)^2+(11,4\text{-}10,8)^2}}{3\text{-}1}$

$= 0,566$