

Lampiran

1. Hasil perhitungan pada modul tugas akhir

a. Perhitungan pengukuran 25 RPM pada Friability Tester

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$$\sum xi = 250 \text{ rpm (Hasil penjumlahan 10 data)}$$

$$n = 10$$

Ditanya :

$$\bar{x} = \text{rata-rata...?}$$

Jawab :

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

$$\bar{x} = \frac{250}{10} = 25 \text{ rpm}$$

2) Koreksi

$$\text{Koreksi} = \bar{X} - Y$$

Diketahui:

$$\bar{X} = 25 \text{ rpm}$$

$$Y = 25 \text{ rpm}$$

Ditanya :

$$\text{Koreksi...?}$$

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 25 - 25 = 0 \text{ rpm} \end{aligned}$$

3) % Error

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

Diketahui:

$$Y = 25 \text{ rpm}$$

$$\bar{X} = 25 \text{ rpm}$$

Ditanya:

$$\% \text{ Error...?}$$

Jawab

$$\% \text{ Error} = \frac{Y - \bar{X}}{Y} \times 100 = \frac{25 - 25}{25} \times 100 = 0\%$$

b. Perhitungan pengukuran 25 RPM dengan Tachometer

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$$\sum xi = 506.7 \text{ rpm (Hasil penjumlahan 20 data)}$$

$$n = 20$$

Ditanya :

$$\bar{x} = \text{rata-rata...?}$$

Jawab :

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

$$\bar{x} = \frac{506.7}{20} = 25.3 \text{ rpm}$$

2) Koreksi

$$\text{Koreksi} = \bar{X} - Y$$

Diketahui:

$$\bar{X} = 25.3 \text{ rpm}$$

$$Y = 25 \text{ rpm}$$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 25.3 - 25 = 0.3 \text{ rpm} \end{aligned}$$

3) % Error

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

Diketahui:

$$Y = 25 \text{ rpm}$$

$$\bar{X} = 25.3 \text{ rpm}$$

Ditanya:

% Error...?

Jawab

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

$$= \frac{25 - 25.3}{25} \times 100 = 1.2\%$$

c. Perhitungan pengukuran waktu 4 menit (240 detik)

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$\sum xi = 4817$ detik (Hasil penjumlahan 20 data)

$$n = 20$$

Ditanya :

$$\bar{x} = \text{rata-rata...?}$$

Jawab :

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

$$\bar{x} = \frac{4817}{20} = 240.8 \text{ detik}$$

2) Koreksi

$$\text{Koreksi} = \bar{X} - Y$$

Diketahui:

$$\bar{X} = 240.8 \text{ detik}$$

$$Y = 240 \text{ detik}$$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 240.8 - 240 = 0.8 \end{aligned}$$

3) % Error

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

Diketahui:

$$Y = 240 \text{ detik}$$

$$\bar{X} = 240.8 \text{ detik}$$

Ditanya:

% Error...?

Jawab

$$\% \text{ Error} = \frac{Y - \bar{X}}{Y} \times 100 = \frac{240 - 240.8}{240} \times 100 = 0.3\%$$

d. Perhitungan tegangan *supply* sebelum bekerja

a) Pengukuran Tegangan 12 V

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$\sum xi = 49.66$ V (Hasil penjumlahan 10 data)

$n = 10$

Ditanya :

\bar{x} = rata-rata....?

Jawab :

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

$$\bar{x} = \frac{49.66}{4} = 12.41 \text{ Volt}$$

2) Koreksi

Koreksi = $\bar{X} - Y$

Diketahui:

$\bar{X} = 12.41 \text{ volt}$

$Y = 12 \text{ volt}$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 12.41 - 12 = 0.4 \end{aligned}$$

3) % Error

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

Diketahui:

$Y = 12 \text{ volt}$

$\bar{X} = 12.41 \text{ volt}$

Ditanya:

% Error...?

Jawab

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

$$= \frac{12 - 12.41}{12} \times 100 = 4\%$$

b) Pengukuran Tegangan 5V

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$\sum xi = 19.98$ V (Hasil penjumlahan 10 data)

$n = 10$

Ditanya :

\bar{x} = rata-rata....?

Jawab :

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

$$\bar{x} = \frac{19.98}{10} = 1.998 \text{ Volt}$$

2) Koreksi

Koreksi = $\bar{X} - Y$

Diketahui:

$\bar{X} = 4.99$ volt

$Y = 5$ volt

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 4.99 - 5 = 0.01 \end{aligned}$$

3) % Error

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

Diketahui:

$Y = 5$ volt

$\bar{X} = 4.99$ volt

Ditanya:

% Error...?

Jawab

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

$$= \frac{5 - 4.99}{5} \times 100 = 0.2\%$$

e. Perhitungan tegangan supply sesudah bekerja

a) Pengukuran Tegangan 12 V

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$\sum xi = 48.34$ V (Hasil penjumlahan 10 data)

$n = 4$

Ditanya :

\bar{x} = rata-rata....?

Jawab :

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

$$\bar{x} = \frac{48.34}{4} = 12.08 \text{ Volt}$$

2) Koreksi

Koreksi = $\bar{X} - Y$

Diketahui:

$\bar{X} = 12.08 \text{ volt}$

$Y = 12 \text{ volt}$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 12.08 - 12 = 0.08 \end{aligned}$$

3) % Error

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

Diketahui:

$Y = 12 \text{ volt}$

$\bar{X} = 12.08 \text{ volt}$

Ditanya:

% Error...?

Jawab

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

$$= \frac{12 - 12.08}{12} \times 100 = 0.66\%$$

b) Pengukuran Tegangan 5 V

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$\sum xi = 19.15$ V (Hasil penjumlahan 10 data)

$n = 4$

Ditanya :

\bar{x} = rata-rata....?

Jawab :

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

$$\bar{x} = \frac{19.15}{4} = 4.78 \text{ Volt}$$

2) Koreksi

Koreksi = $\bar{X} - Y$

Diketahui:

$\bar{X} = 4.78 \text{ volt}$

$Y = 5 \text{ volt}$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 4.78 - 5 = 0.22 \end{aligned}$$

3) % Error

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

Diketahui:

$Y = 5 \text{ volt}$

$\bar{X} = 4.78 \text{ volt}$

Ditanya:

% Error...?

Jawab

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

$$= \frac{5 - 4.78}{5} \times 100 = 4.4\%$$

f. Perhitungan Tegangan motor DC

a) Setting waktu 1 menit

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$$\sum xi = 101.08 \text{ V (Hasil penjumlahan 10 data)}$$

$$n = 10$$

Ditanya :

$$\bar{x} = \text{rata-rata...?}$$

Jawab :

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

$$\bar{x} = \frac{101.08}{10} = 10.10 \text{ Volt}$$

2) Koreksi

$$\text{Koreksi} = \bar{X} - Y$$

Diketahui:

$$\bar{X} = 10.10 \text{ volt}$$

$$Y = 10 \text{ volt}$$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 10.10 - 10 = 0.1 \end{aligned}$$

3) % Error

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

Diketahui:

$$Y = 10 \text{ volt}$$

$$\bar{X} = 10.10 \text{ volt}$$

Ditanya:

% Error...?

Jawab

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

$$= \frac{10 - 10.10}{10} \times 100 = 1\%$$

b) Setting waktu 2 menit

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$$\sum xi = 101.1 \text{ V (Hasil penjumlahan 10 data)}$$

$$n = 10$$

Ditanya :

$$\bar{x} = \text{rata-rata...?}$$

Jawab :

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

$$\bar{x} = \frac{101.1}{10} = 10.11 \text{ Volt}$$

2) Koreksi

$$\text{Koreksi} = \bar{X} - Y$$

Diketahui:

$$\bar{X} = 10.11 \text{ volt}$$

$$Y = 10 \text{ volt}$$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 10.11 - 10 = 0.11 \end{aligned}$$

3) % Error

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

Diketahui:

$$Y = 10 \text{ volt}$$

$$\bar{X} = 10.11 \text{ volt}$$

Ditanya:

% Error...?

Jawab

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

$$= \frac{10 - 10.11}{10} \times 100 = 1.1\%$$

c) Setting waktu 3 menit

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$$\sum xi = 101.26 \text{ V (Hasil penjumlahan 10 data)}$$

$$n = 10$$

Ditanya :

$$\bar{x} = \text{rata-rata...?}$$

Jawab :

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

$$\bar{x} = \frac{101.26}{10} = 10.12 \text{ Volt}$$

4) Koreksi

$$\text{Koreksi} = \bar{X} - Y$$

Diketahui:

$$\bar{X} = 10.12 \text{ volt}$$

$$Y = 10 \text{ volt}$$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 10.12 - 10 = 0.12 \end{aligned}$$

5) % Error

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

Diketahui:

$$Y = 10 \text{ volt}$$

$$\bar{X} = 10.12 \text{ volt}$$

Ditanya:

% Error...?

Jawab

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

$$= \frac{10 - 10.12}{10} \times 100 = 1.2\%$$

d) Setting waktu 4 menit

1) Rata-rata

$$\text{Rata-rata } \bar{x} = \frac{\sum xi}{n}$$

Diketahui :

$$\sum xi = 101.06 \text{ V (Hasil penjumlahan 10 data)}$$

$$n = 10$$

Ditanya :

$$\bar{x} = \text{rata-rata...?}$$

Jawab :

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

$$\bar{x} = \frac{101.06}{10} = 10.10 \text{ Volt}$$

2) Koreksi

$$\text{Koreksi} = \bar{X} - Y$$

Diketahui:

$$\bar{X} = 10.10 \text{ volt}$$

$$Y = 10 \text{ volt}$$

Ditanya :

Koreksi...?

Jawab :

$$\begin{aligned} \text{Koreksi} &= \bar{X} - Y \\ &= 10.10 - 10 = 0.1 \end{aligned}$$

3) % Error

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

Diketahui:

$$Y = 10 \text{ volt}$$

$$\bar{X} = 10.10 \text{ volt}$$

Ditanya:

% Error...?

Jawab

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

$$= \frac{10 - 10.10}{10} \times 100 = 1\%$$

g. Perhitungan rata-rata massa tablet yang hilang

a) Alat friability tester penelitian

1) Mylanta

Diketahui :

X (Berat awal) : 13.846 gram

Y (Berat akhir) : 13.833 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{13.846 - 13.833}{13.846} \times 100 = 0.093\%$$

2) Promag

Diketahui :

X (Berat awal) : 14.818 gram

Y (Berat akhir) : 14.724 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{14.818 - 14.724}{14.818} \times 100 = 0.634\%$$

3) Paracetamol

Diketahui :

X (Berat awal) : 11.592 gram

Y (Berat akhir) : 11.485 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{11.592 - 11.485}{11.592} \times 100 = 0.923\%$$

4) Asam Mefenamat

Diketahui :

X (Berat awal) : 12.819 gram

Y (Berat akhir) : 12.808gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{12.819 - 12.808}{12.819} \times 100 = 0.085\%$$

5) Reumachyil

Diketahui :

X (Berat awal) : 16.591 gram

Y (Berat akhir) : 16.505 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{16.591 - 16.505}{16.591} \times 100 = 0.518\%$$

b) Alat friability tester pembanding

1) Mylanta

Diketahui :

X (Berat awal) : 13.811 gram

Y (Berat akhir) : 13.788 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{13.811 - 13.788}{13.811} \times 100 = 0.166\%$$

2) Promag

Diketahui :

X (Berat awal) : 14.781 gram

Y (Berat akhir) : 14.687 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{14.781 - 14.687}{14.781} \times 100 = 0.635\%$$

3) Paracetamol

Diketahui :

X (Berat awal) : 11.609 gram

Y (Berat akhir) : 11.495 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{11.609 - 11.495}{11.609} \times 100 = 0.981\%$$

4) Asam Mefenamat

Diketahui :

X (Berat awal) : 12.909 gram

Y (Berat akhir) : 12.883gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{12.909 - 12.883}{12.909} \times 100 = 0.201\%$$

5) Reumachyil

Diketahui :

X (Berat awal) : 16.711 gram

Y (Berat akhir) : 16.606 gram

Ditanya : \bar{X} ... ?

Jawab

$$\bar{X} = \frac{X - Y}{X} \times 100$$

$$\bar{X} = \frac{16.711 - 16.606}{16.711} \times 100 = 0.628$$

2. Pembuatan Program Keseluruhan

```
#include <HX711.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <EEPROM.h>

LiquidCrystal_I2C lcd(0x27,16,2);

//nofel
#define DOUT A0
#define CLK A1

HX711 scale;

float calibration_factor = 5850; //-7050 worked for
my 440lb max scale setup
float units;
float units2;
float ounces;

int pb = 1;//button kaki 1 habis dari dina
int pb2 = 2;
int pb3 = 3;
int pb4 = 0;
int ok=0;
int set=0;
int plus=0;
int jalan=0;
float save;
float uplod;
float hasil;
int ditekan;
```

```
//dina
int relay = 5;
int motor = 6;
int count=0;
int a=0;
int b=0;
//timer
int S = 0; // count seconds
int M = 4; // count minutes
void setup() {
  Serial.begin(9600);
  // set up the LCD's number of columns and rows:
  lcd.begin();
  lcd.backlight();
  lcd.setCursor (3,0);
  lcd.print("Friability");
  lcd.setCursor (5,1);
  lcd.print("Tester");
  lcd.setCursor (0,0);
  delay(2000);
  lcd.print("Ardina Shinta P");
  lcd.setCursor (0,1);
  lcd.print("20163010051");
  delay(2000);
  lcd.setCursor (0,0);
  lcd.print("Nofela Annisa Z");
  lcd.setCursor (0,1);
  lcd.print("20163010061");
  pinMode(pb, INPUT_PULLUP);
  digitalWrite (pb, HIGH);
  pinMode(pb2, INPUT_PULLUP);
  digitalWrite (pb2, HIGH);
  pinMode(pb3, INPUT_PULLUP);
  digitalWrite (pb3, HIGH); pinMode (pb4, INPUT_PULLUP);
  digitalWrite (pb4, HIGH);
```



```
    scale.begin(DOUT, CLK);
    scale.set_scale();
    scale.tare(); //Reset the scale to 0
    long zero_factor = scale.read_average(); //Get a
baseline reading
    delay(2000);
    lcd.clear();
}
void(* resetFunc) (void) = 0;
void loop() {
    int pbx=digitalRead(pb);
    int pbx2=digitalRead(pb2);
    int pbx3=digitalRead(pb3);
    int pbx4=digitalRead(pb4);
    if(pbx3==LOW)
    {
        ditekan=1;
    }
    if(pbx4==LOW)
    {
        digitalWrite(motor, LOW);
        delay(300);
        resetFunc();
    }
    if(set==0)
    {
        lcd.setCursor(0, 0);
        lcd.print("Masukan obat");
        lcd.print(" ");
        if(pbx2==LOW)
        {
            ok=1;
            plus=0;
            lcd.setCursor(0, 0);
            lcd.print("Berat Pertama");
            lcd.print(" ");}
```

```
    if (ok==1)
    {
        if(plus<=5)
        {
            scale.set_scale(calibration_factor);
//Adjust to this calibration factor

            units = scale.get_units(5);
            if (units < 0)
            {
                units = 0.000;
            }
            plus++;
        }

        else
        {
            lcd.setCursor(0, 1);
            lcd.print("Grams: ");
            lcd.print(units,3);
            //EEPROM.update(save,units);
            save=units;
        }
    }
}
if(pbx==LOW)
{
    a=0;
    set+=1;
    delay(500);
    if(set>2)set=2;
    lcd.clear();
}
// if(set==1)
//{
//    lcd.clear();
//    delay(500);
```

```
if(set==1)
{
  if(a==0)
  {
    timer();
  }
  else
  {
    //analogWrite(motor,0);
  }
}
if(a==1)
{
  analogWrite(motor,0);
}
if(set==2)
{
  if(ditekan==1)
  {
    lcd.setCursor(0, 0);
    lcd.print("Hasil Persen");
    hasil=save-units2;
    hasil=hasil/save;
    hasil=hasil*100;
    lcd.setCursor(0, 1);
    lcd.print("Grams: ");
    lcd.print(hasil,3);
  }
  else{
    //lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Berat Kedua");
    if(pbx2==LOW)
    {
      ok=1;
      plus=0;
    }
  }
}
```

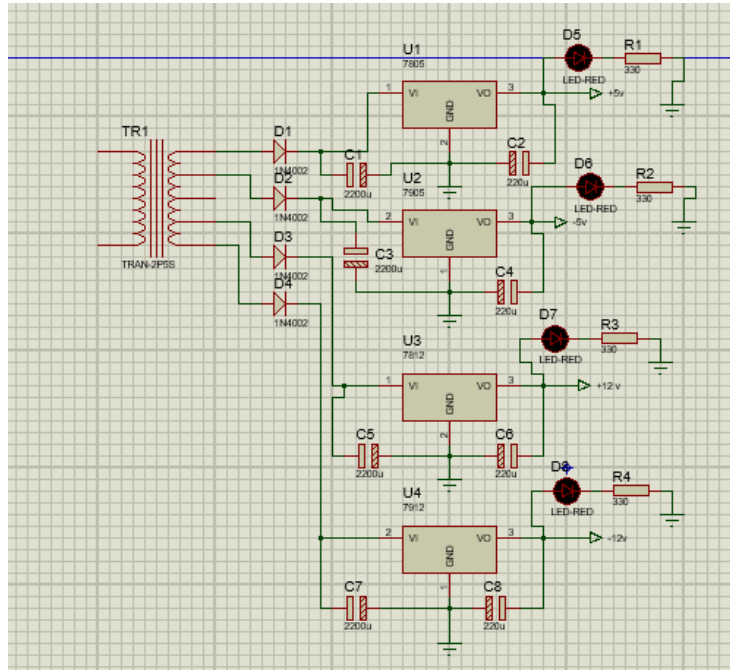
```
        else
        {
            lcd.setCursor(0, 1);
            lcd.print("Grams: ");
            lcd.print(units2,3);
        }
    }
}
}
}
void timer()
{
    lcd.setCursor(1,0);
    lcd.print ("TIMER");
    lcd.setCursor(0,1);
    lcd.print(M);
    lcd.setCursor(2,1);
    lcd.print(":");
    lcd.setCursor(4,1);
    lcd.print(S);
    lcd.print(" ");
    lcd.setCursor(11,0);
    lcd.print ("RPM");
    lcd.setCursor(11,1);
    lcd.print("25");
    digitalWrite(relay, HIGH);
    analogWrite(motor, 173); // turn the LED on
(HIGH is the voltage level)
    S--;
    delay(1000);
}
```

```
    if(S<0)
    {
        M--;
        S=59;
    }

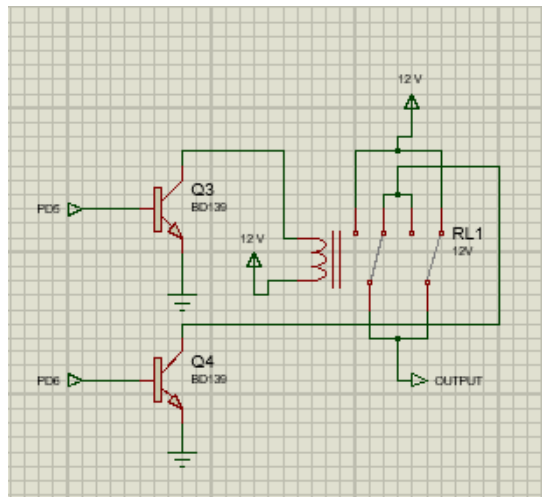
    if(M<0)
    {
        lcd.clear();
        delay(200);
        a=1;
        S=0;
        M=4;
        digitalWrite(motor, LOW);
```

3. Rangkaian

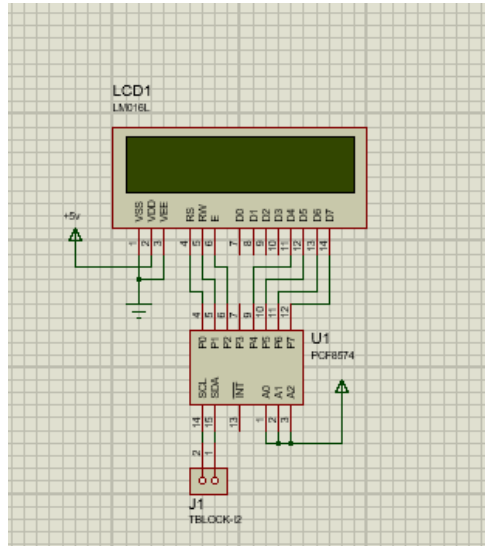
1) Rangkaian *Power Supply*



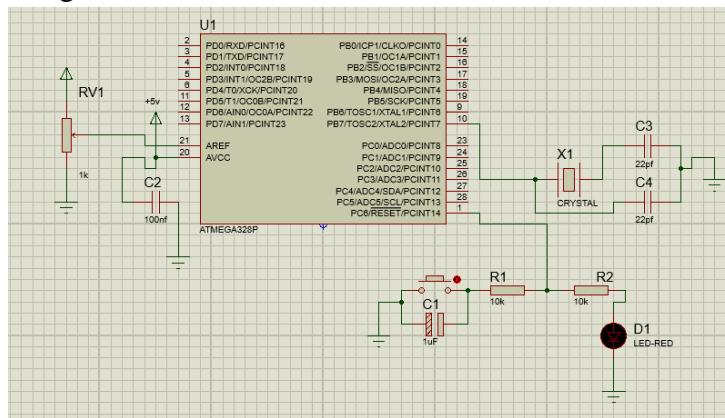
2) Rangkaian *driver*



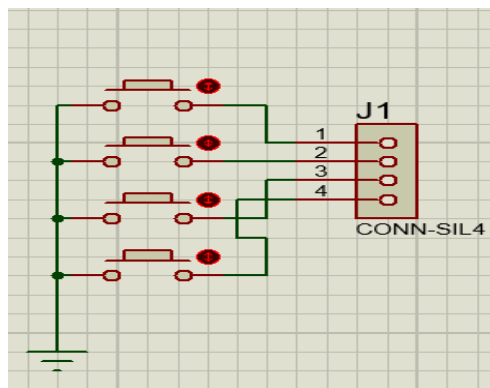
3) Rangkaian LCD



4) Rangkaian Minimum System

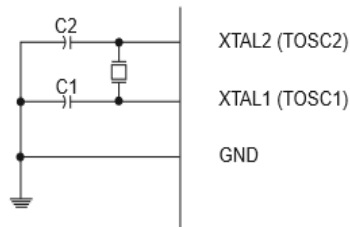


5) Rangkaian Push button



ATmega48P/88P/168P/328P

Figure 6-2. Crystal Oscillator Connections



The Low Power Oscillator can operate in three different modes, each optimized for a specific frequency range. The operating mode is selected by the fuses CKSEL3..1 as shown in [Table 6-3 on page 29](#).

Table 6-3. Low Power Crystal Oscillator Operating Modes⁽³⁾

| Frequency Range ⁽¹⁾ (MHz) | Recommended Range for Capacitors C1 and C2 (pF) | CKSEL3..1 |
|---|--|--------------------|
| 0.4 - 0.9 | – | 100 ⁽²⁾ |
| 0.9 - 3.0 | 12 - 22 | 101 |
| 3.0 - 8.0 | 12 - 22 | 110 |
| 8.0 - 16.0 | 12 - 22 | 111 |

- Notes:
1. This is the recommended CKSEL settings for the different frequency ranges.
 2. This option should not be used with crystals, only with ceramic resonators.
 3. If 8 MHz frequency exceeds the specification of the device (depends on V_{CC}), the CKDIV8 Fuse can be programmed in order to divide the internal frequency by 8. It must be ensured that the resulting divided clock meets the frequency specification of the device.

The CKSEL0 Fuse together with the SUT1..0 Fuses select the start-up times as shown in [Table 6-4](#).



BD135
BD139

NPN SILICON TRANSISTORS

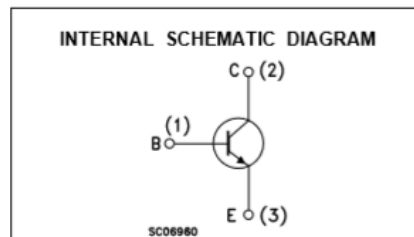
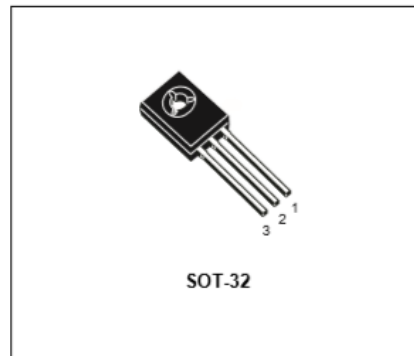
| Type | Marking |
|----------|----------|
| BD135 | BD135 |
| BD135-10 | BD135-10 |
| BD135-16 | BD135-16 |
| BD139 | BD139 |
| BD139-10 | BD139-10 |
| BD139-16 | BD139-16 |

- STMicroelectronics PREFERRED SALESTYPES

DESCRIPTION

The BD135 and BD139 are silicon Epitaxial Planar NPN transistors mounted in Jedec SOT-32 plastic package, designed for audio amplifiers and drivers utilizing complementary or quasi-complementary circuits.

The complementary PNP types are BD136 and BD140 respectively.



Spesifikasi - Analytical Balance MS304TS/00

| | |
|-------------------------------------|---|
| Maximum Capacity | 320 g |
| Readability | 0.1 mg |
| Repeatability (Test Weight) | 0.1 mg (100 g) |
| Minimum Weight (USP, 0.1%, typical) | 0.16 g |
| Adjustment | Internal / FACT |
| Weighing Pan Diameter | 90 mm |
| Display | 7" color TFT touchscreen |
| Legal for Trade | No |
| Settling Time | 3 s |
| Repeatability, typical | 0.08 mg |
| Interfaces | LAN; USB Host; USB Device; RS232; Optional WLAN/Bluetooth |
| Dimensions (DxHxW) | 347 mm x 348 mm x 204 mm |
| Applications | Weighing; Back-weighing; Differential weighing; Check weighing; Totaling; Formulation; Density; Dynamic weighing; Percent weighing; Counting; Factor weighing |
| Guaranteed Repeatability | 0.1 mg |
| Housing | Die-cast aluminum |
| Linearity \pm | 0.2 mg |
| Linearity, typical | 0.06 mg |
| Minimum Weight (U=1%, k=2), typical | 0.016 g |