Program

```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,16,2);

#include <ESP8266WiFi.h> // memsaukan Library ESP8266
#include <WiFiClientSecure.h>
#include <UniversalTelegramBot.h> // memasukan Library TelegramBot

#include "EmonLib.h"             // Include Emon Library
#define VOLT_CAL 449
#define CURRENT_CAL 15

EnergyMonitor emon1;             // Create an instance
//sesuikan posisi pin select
int s0 = D3;
int s1 = D2;
int s2 = D1;

//gunakan A0 sebagai input
int analogPin = A0;

//variabel untuk menyimpan arus dan tegangan
int arus;
int volt;

char ssid[] = "AndroidAP";     // Nama wi-fi
char password[] = "yimt1222"; // password wifi
```

```
// Initialize Telegram BOT
#define BOTtoken "898074876:AAHxsUGK2pkhWZbZc9g7vPiyYq9ZmiNDQow" // kode API telegram / token bot telegram
String chat_id = "674918211";

WiFiClientSecure client;
UniversalTelegramBot bot(BOTtoken, client);

int Bot_mtbs = 1000;
long Bot_lasttime;
bool Start = false;

const int ledPin = LED_BUILTIN; // menggunakan LED bawaan Wemos / Nodemcu, bisa diganti dengan pin lain, misal const int ledPin = 13;
int ledStatus;
```

```
void handleNewMessages(int numNewMessages) {
  ESP.wdtEnable(WDTO_8S);
  Serial.println("Pesan Baru Masuk");
  Serial.println(String(numNewMessages));

  for (int i=0; i<numNewMessages; i++) {
    String chat_id = String(bot.messages[i].chat_id);
    String text = bot.messages[i].text;
    String from_name = bot.messages[i].from_name;

      if (from_name == "")
        {
          from_name = "Guest";
        }


      if (text == "/Arus")
        {
          ESP.wdtFeed();
           ESP.wdtEnable(WDTO_8S);
          //memilih y0 sebagai input
          digitalWrite(s0,LOW);
          digitalWrite(s1,LOW);
          digitalWrite(s2,LOW);
          arus= analogRead(analogPin);
          emon1.calcVI(20,1000);
          float currentDraw  = emon1.Irms;
```

```
ESP.wdtEnable(WDTO_8S);
                        //memilih y1 sebagai input
                        digitalWrite(s0,HIGH);
                        digitalWrite(s1,LOW);
                        digitalWrite(s2,LOW);
                        volt = analogRead(analogPin);

                        emon1.calcVI(20,1000);
                        float supplyVoltage   = emon1.Vrms;                    //extract Vrms into Variable

                        if (supplyVoltage <=100.34)
                             {
                              ESP.wdtEnable(WDTO_8S);
                               String Arus = "Arus Listik Terukur sekitar : ";
                                Arus += ("0.00");
                                Arus += " Ampere\n";
                                Arus += "Harap Hemat Listrik ya \n";
                                bot.sendMessage(chat_id, Arus, "");
                             }

                          if (supplyVoltage >=100.34)
                             {
                              ESP.wdtEnable(WDTO_8S);
                           String Arus = "Arus Listik Terukur sekitar : ";
                                Arus += float(currentDraw);
                                Arus += " Ampere\n";
                                Arus += "Harap Hemat Listrik ya \n";
                                bot.sendMessage(chat_id, Arus, "");
```

```
                                }
  }


else if (text == "/Daya")
  {
     ESP.wdtFeed();
     ESP.wdtEnable(WDTO_8S);
    //memilih y0 sebagai input
    digitalWrite(s0,LOW);
    digitalWrite(s1,LOW);
    digitalWrite(s2,LOW);
    arus= analogRead(analogPin);
    emon1.calcVI(20,1000);
    float currentDraw  = emon1.Irms;

    ESP.wdtEnable(WDTO_8S);
                          //memilih y1 sebagai input
                          digitalWrite(s0,HIGH);
                          digitalWrite(s1,LOW);
                          digitalWrite(s2,LOW);
                          volt = analogRead(analogPin);

                          emon1.calcVI(20,1000);
                          float supplyVoltage   = emon1.Vrms;                    //extract Vrms into Variable
                           if (supplyVoltage <=100.34)
                               {
                                ESP.wdtEnable(WDTO_8S);
```

```
String Daya = "Daya Beban Listrik Terukur sekitar : ";
Daya += ("0.00");
Daya += " Watt\n";
Daya += "Harap dikondisikan pemakaian beban yang tidak digunakan \n";
bot.sendMessage(chat_id, Daya, "");
}

if (supplyVoltage >=100.34)
{
ESP.wdtEnable(WDTO_8S);
String Daya = "Daya Beban Listik Terukur sekitar : ";
Daya += float(supplyVoltage*currentDraw);
Daya += " Watt\n";
Daya += "Harap dikondisikan pemakaian beban yang tidak digunakan \n";
bot.sendMessage(chat_id, Daya, "");
}
}


else if (text == "/Volt") {
ESP.wdtFeed();
ESP.wdtEnable(WDTO_8S);
//memilih y1 sebagai input
digitalWrite(s0,HIGH);
digitalWrite(s1,LOW);
digitalWrite(s2,LOW);
volt = analogRead(analogPin);
```

```
emon1.calcVI(20,1000);
float supplyVoltage   = emon1.Vrms;                    //extract Vrms into Variable
 if (supplyVoltage <=100.34)
     {
      ESP.wdtEnable(WDTO_8S);
       String Daya = "Daya Beban Listrik Terukur sekitar : ";
        Daya += ("0.00");
        Daya += " Watt\n";
        Daya += "Harap dikondisikan pemakaian beban yang tidak digunakan \n";
        bot.sendMessage(chat_id, Daya, "");
     }

  if (supplyVoltage >=100.34)
     {
      ESP.wdtEnable(WDTO_8S);
   String Daya = "Daya Beban Listik Terukur sekitar : ";
        Daya += float(supplyVoltage*currentDraw);
        Daya += " Watt\n";
        Daya += "Harap dikondisikan pemakaian beban yang tidak digunakan \n";
        bot.sendMessage(chat_id, Daya, "");
     }
}


else if (text == "/Volt") {
 ESP.wdtFeed();
ESP.wdtEnable(WDTO_8S);
//memilih y1 sebagai input
```

```
//memilih y1 sebagai input
digitalWrite(s0,HIGH);
digitalWrite(s1,LOW);
digitalWrite(s2,LOW);
volt = analogRead(analogPin);

emon1.calcVI(20,1000);
float supplyVoltage   = emon1.Vrms;                    //extract Vrms into Variable

if (supplyVoltage <=100.34)
     {
      ESP.wdtEnable(WDTO_8S);
       String Volt= "Volt Listik Terukur sekitar : ";
        Volt += ("0.00");
        Volt += " VAC\n";
        Volt += "Hati-hati tegangan berbahaya \n";
        bot.sendMessage(chat_id, Volt, "");
     }

  if (supplyVoltage >=100.34)
     {
      ESP.wdtEnable(WDTO_8S);
    String Volt= "Volt Listik Terukur sekitar : ";
    Volt += float(supplyVoltage);
    Volt += " VAC\n";
    Volt += "Hati-hati tegangan berbahaya \n";
    bot.sendMessage(chat_id, Volt, "");
     }
```

```
                                }

}


  else if (text == "/Tarif")
    {
      ESP.wdtFeed();
       ESP.wdtEnable(WDTO_8S);
      //memilih y0 sebagai input
      digitalWrite(s0,LOW);
      digitalWrite(s1,LOW);
      digitalWrite(s2,LOW);
      arus= analogRead(analogPin);
      emon1.calcVI(20,1000);
      float currentDraw  = emon1.Irms;

      ESP.wdtEnable(WDTO_8S);
                              //memilih y1 sebagai input
                              digitalWrite(s0,HIGH);
                              digitalWrite(s1,LOW);
                              digitalWrite(s2,LOW);
                              volt = analogRead(analogPin);

                              emon1.calcVI(20,1000);
                              float supplyVoltage   = emon1.Vrms;                    //extract Vrms into Variable
```

```
                    if (supplyVoltage <=100.34)
                        {
                         ESP.wdtEnable(WDTO_8S);
                          String Tarif = "Tarif Pemakaian Beban Listik sekitar Rp : ";
                           Tarif += ("0.00");
                           Tarif += " \n";
                           Tarif += "Harap Hemat Listrik ya \n";
                           bot.sendMessage(chat_id, Tarif, "");
                        }

                      if (supplyVoltage >=100.34)
                        {
                         ESP.wdtEnable(WDTO_8S);
                       String Tarif = "Tarif Pemakaian Beban Listik sekitar Rp : ";
                           Tarif += float(supplyVoltage*currentDraw / 1000 * 1467.26);
                           Tarif += " \n";
                           Tarif += "Harap Hemat Listrik ya \n";
                           bot.sendMessage(chat_id, Tarif, "");
                        }
            }

        }
}

void setup() {
  Wire.begin(D5,D6);
 lcd.begin();
 lcd.backlight(); // Enable or Turn On the backlight
```

```
   lcd.setCursor(0, 0);
lcd.print("MEMULAI MENGUKURAN");
lcd.setCursor(0, 1);
lcd.print("................");
// lcd.clear();
 delay(11000);
 lcd.clear();
 ESP.wdtEnable(WDTO_8S);
 ESP.wdtEnable(WDTO_8S);
 ESP.wdtEnable(WDTO_8S);
 ESP.wdtEnable(WDTO_8S);
 ESP.wdtEnable(WDTO_8S);
  Serial.begin(115200);
  WiFi.mode(WIFI_STA);
  WiFi.disconnect(); // putuskan koneksi wi-fi jika sebelumnya sudah tersambung
  delay(100);
  Serial.print("Mengkoneksikan dengan Wi-fi : ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);

  while (WiFi.status() != WL_CONNECTED)
    {
      Serial.print(".");
      delay(500);
    }

  Serial.println("");
  Serial.println("Terhubung dengan wi-fi");
  Serial.print("IP address: ");
```

```
  Serial.println(WiFi.localIP());
  pinMode(ledPin, OUTPUT); // set ledPin sebagai OUTPUT
  digitalWrite(ledPin, LOW); // matikan led


          // jika dapat pesan "/start"

            String welcome = "Selamat Datang di channel Monitoring Alat Ukur Listrik IOT \n\n";
            welcome += "Ini adalah Menu Monitoring Alat Ukur Via Telegram Bot.\n\n";
             welcome += "/Arus : untuk memonitoring arus listrik \n";
             welcome += "/Volt : untuk memonitoring tegangan listrik \n";
             welcome += "/Daya : untuk memonitoring daya listrik\n";
             welcome += "/Tarif : untuk memonitoring biaya pemakaian listrik \n";
             bot.sendMessage(chat_id, welcome, "Markdown");
 ESP.wdtEnable(WDTO_8S);
 emon1.voltage(volt, VOLT_CAL, 1.7);  // Voltage: input pin, calibration, phase_shift
 emon1.current(arus, CURRENT_CAL);
 //jadikan pin select sebagai output
  pinMode(s0, OUTPUT);
  pinMode(s1, OUTPUT);
  pinMode(s2, OUTPUT);


}

void loop()
  {
    lcd.begin();
 lcd.backlight(); // Enable or Turn On the backlight
```

```
  ESP.wdtFeed();
  ESP.wdtEnable(WDTO_8S);
  ESP.wdtEnable(WDTO_8S);
  ESP.wdtEnable(WDTO_8S);
  ESP.wdtEnable(WDTO_8S);
  ESP.wdtEnable(WDTO_8S);

//memilih y0 sebagai input
digitalWrite(s0,LOW);
digitalWrite(s1,LOW);
digitalWrite(s2,LOW);
arus= analogRead(analogPin);
emon1.calcVI(20,1000);
float currentDraw  = emon1.Irms;            //extract Irms into Variable
Serial.print("Current: ");
Serial.println(currentDraw);


          //memilih y1 sebagai input
          digitalWrite(s0,HIGH);
          digitalWrite(s1,LOW);
          digitalWrite(s2,LOW);
          volt = analogRead(analogPin);
          emon1.calcVI(20,1000);
          float supplyVoltage   = emon1.Vrms;                  //extract Vrms into Variable
           Serial.print("voltage: ");
          Serial.println(supplyVoltage);
```

```
   if (supplyVoltage <=100.34)
 {
  lcd.clear();
   Serial.print("Voltage: 0.00");
//Serial.println(supplyVoltage);
  lcd.setCursor(0, 0);
    lcd.print("V:0.00");
  //  lcd.print(supplyVoltage);

Serial.print("Current: 0.00");
//Serial.println(currentDraw);
  lcd.setCursor(9, 0);
    lcd.print("P:0.00");
    //lcd.print(currentDraw);

Serial.print("Watts: 0.00");
//Serial.println(currentDraw * supplyVoltage);
Serial.println("\n\n");
 lcd.setCursor(0, 1);
    lcd.print("I:0.00");
   // lcd.print(currentDraw * supplyVoltage);

    Serial.print("Rp: 0.00");
//Serial.println(currentDraw * supplyVoltage);
Serial.println("\n\n");
 lcd.setCursor(8, 1);
    lcd.print("Rp:0.00");
   // lcd.print(currentDraw * supplyVoltage);
```

```
  // delay(5000);
 }


if (supplyVoltage >=100.34)
  {
   lcd.clear();
    //Serial.print("Voltage: 0.00");
 Serial.println(supplyVoltage);
   lcd.setCursor(0, 0);
     lcd.print("V:");
   lcd.print(supplyVoltage);

 //Serial.print("Current: 0.00");
 Serial.println(currentDraw);
   lcd.setCursor(9, 0);
     lcd.print("I:");
     lcd.print(currentDraw);

 //Serial.print("Watts: 0.00");
 Serial.println(currentDraw * supplyVoltage);
 Serial.println("\n\n");
  lcd.setCursor(0, 1);
     lcd.print("P:");
    lcd.print(currentDraw * supplyVoltage);

    // Serial.print("Rp: 0.00");
 Serial.println(currentDraw * supplyVoltage);
```

```
Serial.println("\n\n");
 lcd.setCursor(8, 1);
   lcd.print("Rp:");
    lcd.print(currentDraw * supplyVoltage /1000 * 1467.26);
  // delay(5000);
 }

  if (millis() > Bot_lasttime + Bot_mtbs)
    {
      int numNewMessages = bot.getUpdates(bot.last_message_received + 1);

      while(numNewMessages)
        {
          Serial.println("Memeriksa Respon");
          handleNewMessages(numNewMessages);
          numNewMessages = bot.getUpdates(bot.last_message_received + 1);
        }

      Bot_lasttime = millis();
    }
}
```