

## **LAMPIRAN**

## LAMPIRAN A

### Listing Program

```
#if defined(ESP32)
#include <WiFi.h>
#include <FirebaseESP32.h>
#elif defined(ESP8266)
#include <ESP8266WiFi.h>
#include <FirebaseESP8266.h>
#endif

#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <PZEM004Tv30.h>
#include <SoftwareSerial.h>

SoftwareSerial mySerial(14, 12);
PZEM004Tv30 pzem(mySerial); // 12(connet ke TX PZEM), 13(connet ke RX
PZEM) (RX,TX)

LiquidCrystal_I2C lcd(0x27, 16, 2);
float A, V, P, E;

// Provide the RTDB payload printing info and other helper functions.
#include <addons/RTDBHelper.h>

/* 1. Define the WiFi credentials */
#define WIFI_SSID "RedmiAjah"
#define WIFI_PASSWORD "ungkasya321"

/* 2. If work with RTDB, define the RTDB URL and database secret */
#define DATABASE_URL "cobadb-aca9c-default-rtdb.firebaseio.com"
//<databaseName>.firebaseio.com or
<databaseName>.<region>.firebasedatabase.app
#define DATABASE_SECRET
"iKZ29mijrdWJUWrFvz6fc23by32fGLITo2KAdOue"

/* 3. Define the Firebase Data object */
FirebaseData fbdo;
```

```

/* 4. Define the FirebaseAuth data for authentication data */
FirebaseAuth auth;

/* Define the FirebaseConfig data for config data */
FirebaseConfig config;

unsigned long dataMillis = 0;
int count = 0;

String User;
float Saldo;
String PT;
int Harga = 1650;
int SN;
String SSaldo;

void setup() {
  Serial.begin(115200);

  lcd.init();           // initialize the lcd
  lcd.begin(16, 2);
  lcd.backlight();
  pinMode(2, OUTPUT);

  WiFi.begin(WIFI_SSID, WIFI_PASSWORD);
  Serial.print("Connecting to Wi-Fi");
  while (WiFi.status() != WL_CONNECTED)
  {
    Serial.print(".");
    delay(300);
  }
  Serial.println();
  Serial.print("Connected with IP: ");
  Serial.println(WiFi.localIP());
  Serial.println();

  Serial.printf("Firebase Client v%s\n\n", FIREBASE_CLIENT_VERSION);

  /* Assign the certificate file (optional) */

```

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// config.cert.file = "/cert.cer";
// config.cert.file_storage = StorageType::FLASH;

/* Assign the database URL and database secret(required) */
config.database_url = DATABASE_URL;
config.signer.tokens.legacy_token = DATABASE_SECRET;

Firebase.reconnectWiFi(true);

/* Initialize the library with the Firebase authen and config */
Firebase.begin(&config, &auth);

// Or use legacy authenticate method
// Firebase.begin(DATABASE_URL, DATABASE_SECRET);
digitalWrite(2, LOW);
}

void loop() {
  if (millis() - dataMillis > 5000)
  {
    Serial.printf("Get string... %s\n", Firebase.getString(fbdo, F("/D01/Saldo")) ?
fbdo.to<const char *>() : fbdo.errorReason().c_str());
    Saldo = fbdo.stringData().toFloat();
    Serial.println(Saldo);
    us();
    dataMillis = millis();
    lcd.setCursor(2, 0); lcd.print("SMART CHARGE");
    lcd.setCursor(4, 1); lcd.print("VER. 1.0");
    digitalWrite(2, LOW);
    if (User != "")
    {
      while (User != "") {
        digitalWrite(2, HIGH);
        us();

        //Menampilkan
        lcd.setCursor(0, 0); lcd.print("U : "); lcd.print(User);
      }
    }
  }
}

```

```

        lcd.setCursor(0, 1); lcd.print("S : "); lcd.print("Rp."); lcd.print(Saldo);
    }
    else
    {
        lcd.setCursor(0, 1); lcd.print("S : "); lcd.print("Rp."); lcd.print(SSaldo);
    }

    delay(2000);
    lcd.clear();

    //Menampilkan Energi Terpakai
    E = pzem.energy();
    int E1;
    lcd.setCursor(0, 0); lcd.print("E : "); lcd.print(E, 3); lcd.print("kWh");
    //Menampilkan Total Harga
    float h = 1650 * E;
    lcd.setCursor(0, 1); lcd.print("H : "); lcd.print("Rp."); lcd.print(h);
    if (E!=E1)
    {
        float S1 = Saldo - h;
        SSaldo = String (S1);
        String PT0 = "/";
        String PT1 = PT0 + User;
        String PT2 = PT1 + "/Saldo";
        Serial.printf("Set string... %s\n", Firebase.setString(fbdo, (PT2), SSaldo) ?
"ok" : fbdo.errorReason().c_str());
        Serial.print("Saldo: ");
        Serial.println(Saldo);
        E1=E;
        SN=1;
    }
    if (S1<=1)
    {
        SN=0;
        Serial.print("Saldo Habis");
        digitalWrite(2, LOW);
        PT0 = "/";
        PT1 = PT0 + User;
        PT2 = PT1 + "/Alat";
        Serial.printf("Set string... %s\n", Firebase.setString(fbdo, (PT2), "Device") ?
"ok" : fbdo.errorReason().c_str());
        delay(100);
    }

```

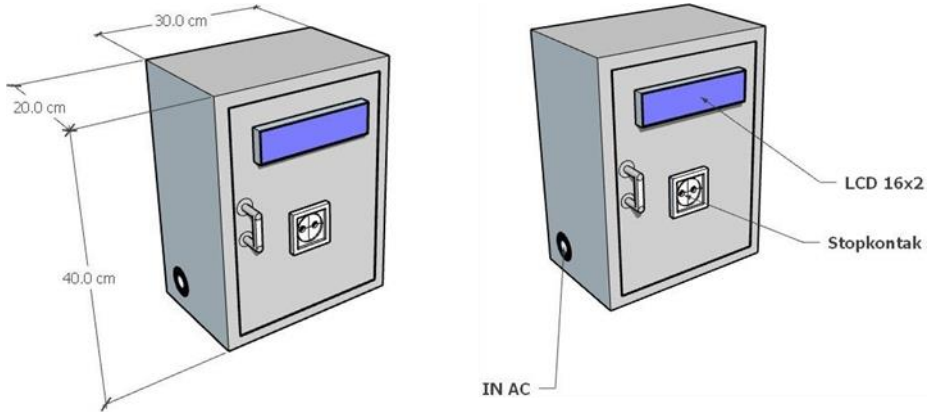
```

PT0 = "/";
PT1 = PT0 + "D01";
PT2 = PT1 + "/Saldo";
Serial.printf("Set string... %s\n", Firebase.setString(fbdo, (PT2), 0) ? "ok" :
fbdo.errorReason().c_str());
delay(100);
PT0 = "/";
PT1 = PT0 + "D01";
PT2 = PT1 + "/User";
Serial.printf("Set string... %s\n", Firebase.setString(fbdo, (PT2), 0) ? "ok" :
fbdo.errorReason().c_str());
delay(100);
}
}
delay(2000);
lcd.clear();
V = pzem.voltage();
lcd.setCursor(0, 0); lcd.print("V : "); lcd.print(V, 3); lcd.print("V");
A = pzem.current();
lcd.setCursor(0, 1); lcd.print("A : "); lcd.print(A, 3); lcd.print("A");
delay(2000);
lcd.clear();

}
}
pzem.resetEnergy();
}
}
void us()
{
Serial.printf("Get string... %s\n", Firebase.getString(fbdo, F("/D01/User")) ?
fbdo.to<const char *>() : fbdo.errorReason().c_str());
String S0 = fbdo.stringData();
String S1 = S0.substring(2);
int l = S1.length();
l = l - 2;
User = S1.substring(0, l);
Serial.print("User: ");
Serial.print(User);
}
}

```

## LAMPIRAN B Desain Alat



### Desain Perancangan Alat Pada Fritzing



Scan QR yang digunakan pada Box

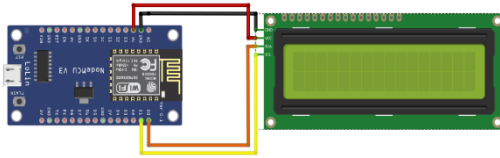


**Tampilan Perancangan Box**

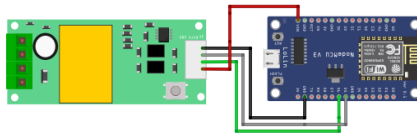


## LAMPIRAN C

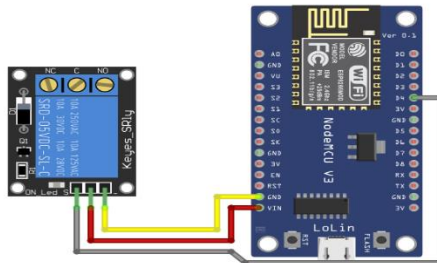
### Rangkaian Wiring



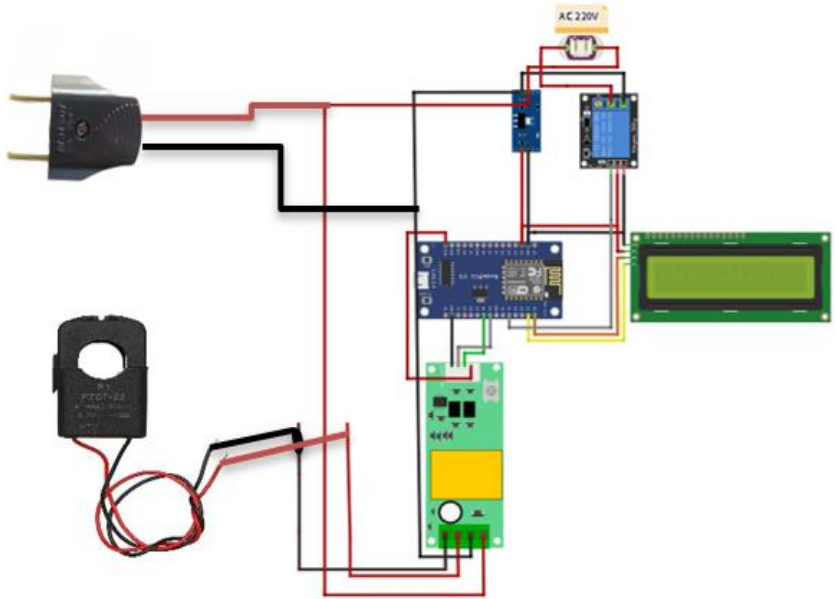
**Rangkaian NodeMCU dengan LCD 16x2**



**Rangkaian NodeMCU dengan Sensor PZEM 004-T**



**Rangkaian NodeMCU dengan Relay**



**Rangkaian Keseluruhan**

**LAMPIRAN D**  
**Gambar Alat**



**Tampilan Akhir Alat**

## **BIODATA PENULIS**



Nama : Ungkasya Zaen Alianta  
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Kelurahan Donan Cilacap, Cilacap  
tengah  
  
Telepon/Hp : 081393616098  
Hobi : Olahraga, Bernyanyi, Bermain Alat Musik  
  
Email : ungaryazaen666@gmail.com  
Motto : A winner is who the dreamer make a dream  
came true !  
Riwayat Pendidikan :  
  
SDN TambakReja 08 : 2006 – 2010  
SMP Islam Al Irsyad Cilacap : 2012 – 2015  
SMK Dr Soetomo : 2015 – 2018  
Politeknik Negeri Cilacap : 2019 – 2020