LAMPIRAN A

Program Sistem Internet Of Things

```
#include <PZEM004Tv30.h>
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
// Blynk and WiFi credentials
#define BLYNK_TEMPLATE_ID "TMPL6amdhACEn"
#define BLYNK_TEMPLATE_NAME "MONITORING IOT"
#define BLYNK_AUTH_TOKEN "07LSX_K-
fhVSazzWHqxKyW8iGdYHeEil"
#define BLYNK_PRINT Serial
char auth[] = "07LSX_K-fhVSazzWHqxKyW8iGdYHeEil";
char ssid[] = "Realme 5 Pro";
char pass[] = "Jar11111";
// PZEM sensor object initialization
PZEM004Tv30 pzem1(D6, D7); // First sensor on pins D6 (RX) & D7
(TX)
PZEM004Tv30 pzem2(D1, D2); // Second sensor on pins D1 (RX) &
D2 (TX)
const float THRESHOLD_VOLTAGE = 1.0; // Voltage threshold for
AC disconnection
const float THRESHOLD_CURRENT = 0.1; // Voltage threshold for
AC disconnection
const float THRESHOLD_POWER = 1.0; // Voltage threshold for AC
disconnection
const int relayPin = D5; // Define the relay pin
const int buttonPin = D4; // Define the pushbutton pin
bool relayState = LOW; // Initial relay state
unsigned long previousMillis = 0; // Stores last time sensor was updated
const long interval = 2000;       // Interval at which to read sensors (2
seconds)
// Blynk button widget handler for toggling the relay
BLYNK_WRITE(V7) {
  relayState = !relayState; // Toggle the relay state
  digitalWrite(relayPin, relayState); // Set the relay pin
```

```
  Blynk.virtualWrite(V7, relayState); // Update the button widget state
}

void setup() {
  Serial.begin(115200);
  Blynk.begin(auth, ssid, pass);
  pinMode(relayPin, OUTPUT); // Set the relay pin as output
  pinMode(buttonPin, INPUT_PULLUP); // Set the button pin as input
with internal pull-up resistor
  digitalWrite(relayPin, relayState); // Initialize the relay state
}
void loop() {
  Blynk.run(); // Keep Blynk connected
  // Read the pushbutton state
  if (digitalRead(buttonPin) == LOW) { // Button is pressed
    relayState = !relayState; // Toggle relay state
    digitalWrite(relayPin, relayState); // Set relay pin
    Blynk.virtualWrite(V7, relayState); // Update Blynk button widget
state
    delay(300); // Debounce delay to prevent multiple toggles
  }
  unsigned long currentMillis = millis();
  // Check if 2 seconds have passed
  if (currentMillis - previousMillis >= interval) {
    previousMillis = currentMillis;
  // Read and process voltage from the first sensor
  float voltage1 = pzem1.voltage();
  if (isnan(voltage1) || voltage1 < THRESHOLD_VOLTAGE) {
    voltage1 = 0;
  }
  Serial.print("Voltage (Sensor 1): ");
  Serial.print(voltage1);
  Serial.println("V");
  Blynk.virtualWrite(V1, voltage1);
  // Read and process voltage from the second sensor
  float voltage2 = pzem2.voltage();
```

```
  if (isnan(voltage2) || voltage2 < THRESHOLD_VOLTAGE) {
    voltage2 = 0;
  }
  Serial.print("Voltage (Sensor 2): ");
  Serial.print(voltage2);
  Serial.println("V");
  Blynk.virtualWrite(V3, voltage2); // Send second sensor voltage to a
new Blynk virtual pin V8
  // Send status to Blynk based on voltage
  int status = (voltage2 > 0) ? 1 : 0; // 1 if voltage is present, otherwise 0
  Blynk.virtualWrite(V9, status); // Send status to Blynk virtual pin V9
  // Reading and displaying current and power (only for the first sensor
as an example)
  float current = pzem1.current();
  if (isnan(current) || current < THRESHOLD_CURRENT) {
    current = 0;
  }
    Serial.print("Current: ");
    Serial.print(current);
    Serial.println("A");
    Blynk.virtualWrite(V2, current);

  float power = pzem1.power();
  if (isnan(power) || power < THRESHOLD_POWER) {
    power = 0;
  }
    Serial.print("Power: ");
    Serial.print(power);
    Serial.println("W");
    Blynk.virtualWrite(V0, power);

  Serial.println();
  delay(2000);
}
}
```

LAMPIRAN B

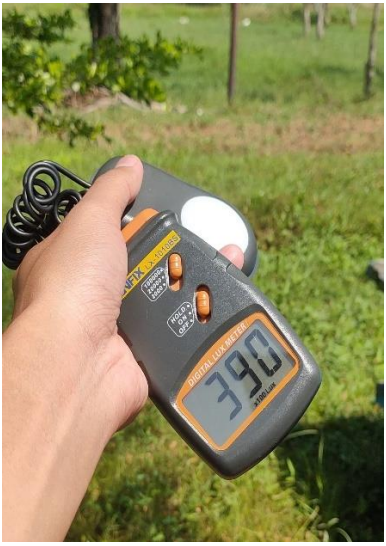
Hasil Alat dan Pengujian

Gambar (a) Hasil alat tampak depan

Gambar (b) hasil alat tampak samping

Gambar (c) Pengukuran Tegangan Pengisian Baterai

Gambar (d) Pengukuran Tegangan Pengisian Baterai



Gambar (e) Pengukuran Intensitas Cahaya Matahari