



Unipa Surabaya

LAMPIRAN

LAMPIRAN 1

Source Coding pada Arduino dan Blynk

```
#include <PZEM004Tv30.h>
#include <LiquidCrystal_I2C.h>
#define BLYNK_PRINT Serial

#define BLYNK_TEMPLATE_ID "TMPL65GwWCtz9"
#define BLYNK_TEMPLATE_NAME "Monitoring Gedung"
#define BLYNK_AUTH_TOKEN "0_ZHDhQkGivMvx1xIID3pOpjYUuaM0wU"

#include <WiFi.h>
#include <WiFiClient.h>
#include <BlynkSimpleEsp32.h>

PZEM004Tv30 gedung1(&Serial2,0x44);
PZEM004Tv30 gedung2(&Serial2,0x55);
PZEM004Tv30 gedung3(&Serial2,0x66);
PZEM004Tv30 gedung4(&Serial2,0x77);

BlynkTimer timer;

LiquidCrystal_I2C lcd(0x27, 16, 2);

#define WIFI_LED 2

char ssid[] = "AP";
char pass[] = "12345678";

float voltage1,voltage2,voltage3,voltage4;
float current1,current2,current3,current4;
float current_threshold = 0.50; //set batas arus
```

```

const int relay1 = 13;
const int relay2 = 12;
const int relay3 = 14;
const int relay4 = 27;

boolean isconnected = LOW;
boolean error = LOW;
int relay_state;

BLYNK_WRITE(V9){
  int relay_state = param.asInt();
  if(relay_state == 1)
  {
    digitalWrite(relay1,LOW);
    digitalWrite(relay2,LOW);
    digitalWrite(relay3,LOW);
    digitalWrite(relay4,LOW);
    error = LOW;
    lcd.clear();
  }
  if(relay_state == 0)
  {
    digitalWrite(relay1,HIGH);
    digitalWrite(relay2,HIGH);
    digitalWrite(relay3,HIGH);
    digitalWrite(relay4,HIGH);
    error = LOW;
    //lcd.clear();
  }
}

void setup() {

```

```

Serial.begin(115200);

lcd.begin();
pinMode(relay1, OUTPUT);
pinMode(relay2, OUTPUT);
pinMode(relay3, OUTPUT);
pinMode(relay4, OUTPUT);

digitalWrite(relay1,HIGH);
digitalWrite(relay2,HIGH);
digitalWrite(relay3,HIGH);
digitalWrite(relay4,HIGH);

lcd.clear();
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("  Sistem  ");
lcd.setCursor(0,1);
lcd.print("Proteksi Gedung ");
delay(1000);
lcd.clear();
lcd.setCursor(0,0);
lcd.print("Connecting...");
Serial.println("Connecting...");
Blynk.begin(BLYNK_AUTH_TOKEN, ssid, pass);

lcd.clear();
lcd.setCursor(0,0);
lcd.print("Connected  ");
delay(1000);
lcd.clear();
digitalWrite(relay1,LOW);
digitalWrite(relay2,LOW);
digitalWrite(relay3,LOW);

```

```

digitalWrite(relay4,LOW);
}

void loop() {
  Blynk.run();
  if(error != HIGH)
  {
    Blynk.virtualWrite(V6,"Normal");

    voltage1 = gedung1.voltage();
    if( !isnan(voltage1) ){
      Serial.print("Voltage Gedung 1: "); Serial.print(voltage1); Serial.println("V");
      Blynk.virtualWrite(V0,voltage1);

    } else {
      Serial.println("Error reading voltage gedung 1");
      lcd.clear();
      lcd.setCursor(0,0);
      lcd.print("Gedung 1 Failure");
      Blynk.virtualWrite(V6,"Gedung 1 Failure");
      digitalWrite(relay1,HIGH);
      digitalWrite(relay2,HIGH);
      digitalWrite(relay3,HIGH);
      digitalWrite(relay4,HIGH);
      error = HIGH;
    }

    voltage2 = gedung2.voltage();
    if( !isnan(voltage2) ){
      Serial.print("Voltage Gedung 2: "); Serial.print(voltage2); Serial.println("V");
      Blynk.virtualWrite(V1,voltage2);

    } else {
      Serial.println("Error reading voltage gedung 2");

```

```

lcd.clear();
lcd.setCursor(0,0);
lcd.print("Gedung 2 Failure");
Blynk.virtualWrite(V6,"Gedung 2 Failure");
digitalWrite(relay1,HIGH);
digitalWrite(relay2,HIGH);
digitalWrite(relay3,HIGH);
digitalWrite(relay4,HIGH);
error = HIGH;
}

voltage3 = gedung3.voltage();
if( !isnan(voltage3) ){
  Serial.print("Voltage Gedung 3: "); Serial.print(voltage3); Serial.println("V");
  Blynk.virtualWrite(V2,voltage3);

} else {
  Serial.println("Error reading voltage gedung 3");
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Gedung 3 Failure");
  Blynk.virtualWrite(V6,"Gedung 3 Failure");
  digitalWrite(relay1,HIGH);
  digitalWrite(relay2,HIGH);
  digitalWrite(relay3,HIGH);
  digitalWrite(relay4,HIGH);
  error = HIGH;
}

voltage4 = gedung4.voltage();
if( !isnan(voltage4) ){
  Serial.print("Voltage Gedung 4: "); Serial.print(voltage4); Serial.println("V");
  Blynk.virtualWrite(V3,voltage4);
}

```

```

} else {
  Serial.println("Error reading voltage gedung 4");
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Gedung 4 Failure");
  Blynk.virtualWrite(V6,"Gedung 4 Failure");
  digitalWrite(relay1,HIGH);
  digitalWrite(relay2,HIGH);
  digitalWrite(relay3,HIGH);
  digitalWrite(relay4,HIGH);
  error = HIGH;
}

}

if(error != HIGH)
{
current1 = gedung1.current();
if( !isnan(current1) ){
  Serial.print("Current Gedung 1: "); Serial.print(current1); Serial.println("A");
  Blynk.virtualWrite(V4,current1);
  lcd.setCursor(0,0);
  lcd.print(current1,3);
  if(current1 >= current_threshold)
  {
    digitalWrite(relay1,HIGH);
    digitalWrite(relay2,HIGH);
    digitalWrite(relay3,HIGH);
    digitalWrite(relay4,HIGH);
    Blynk.virtualWrite(V6,"Over Current! Gedung 1");
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print(" Over Current! ");

```

```

    lcd.setCursor(0,1);
    lcd.print("  Gedung 1 ");
    error = HIGH;
  }
} else {
  Serial.println("Error reading current gedung 1");
}
}
if(error != HIGH)
{
current2 = gedung2.current();
if( !isnan(current2) ){
  Serial.print("Current Gedung 2: "); Serial.print(current2); Serial.println("A");
  Blynk.virtualWrite(V5,current2);
  lcd.setCursor(7,0);
  lcd.print(current2,3);
  if(current2 >= current_threshold)
  {
    digitalWrite(relay1,HIGH);
    digitalWrite(relay2,HIGH);
    digitalWrite(relay3,HIGH);
    digitalWrite(relay4,HIGH);
    Blynk.virtualWrite(V6,"Over Current! Gedung 2");
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print(" Over Current! ");
    lcd.setCursor(0,1);
    lcd.print("  Gedung 2 ");
    error = HIGH;
  }
} else {
  Serial.println("Error reading current gedung 2");
}
}
}

```



```

if(error != HIGH)
{
current3 = gedung3.current();
if( !isnan(current3) ){
  Serial.print("Current Gedung 3: "); Serial.print(current3); Serial.println("A");
  Blynk.virtualWrite(V7,current3);
  lcd.setCursor(0,1);
  lcd.print(current3,3);
  if(current3 >= current_threshold)
  {
    digitalWrite(relay1,HIGH);
    digitalWrite(relay2,HIGH);
    digitalWrite(relay3,HIGH);
    digitalWrite(relay4,HIGH);
    Blynk.virtualWrite(V6,"Over Current! Gedung 3");
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print(" Over Current! ");
    lcd.setCursor(0,1);
    lcd.print("  Gedung 3  ");
    error = HIGH;
  }
} else {
  Serial.println("Error reading current gedung 3");
}
}

if(error != HIGH)
{
current4 = gedung4.current();
if( !isnan(current1) ){
  Serial.print("Current Gedung 4: "); Serial.print(current4); Serial.println("A");
  Blynk.virtualWrite(V8,current4);

```

```

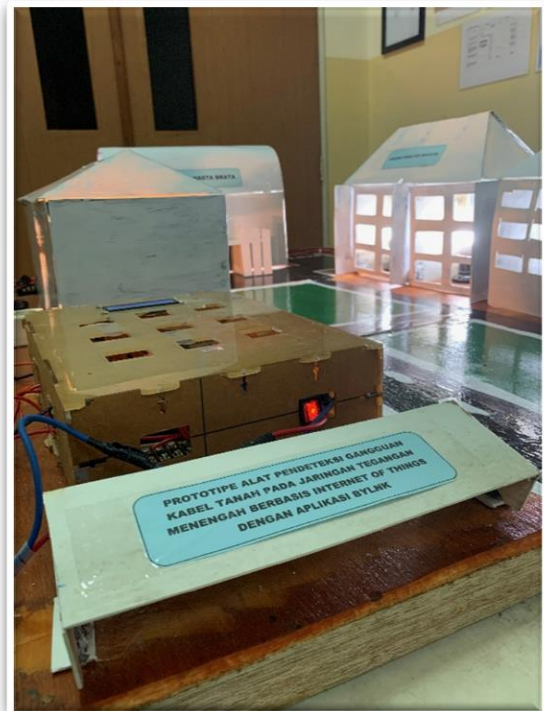
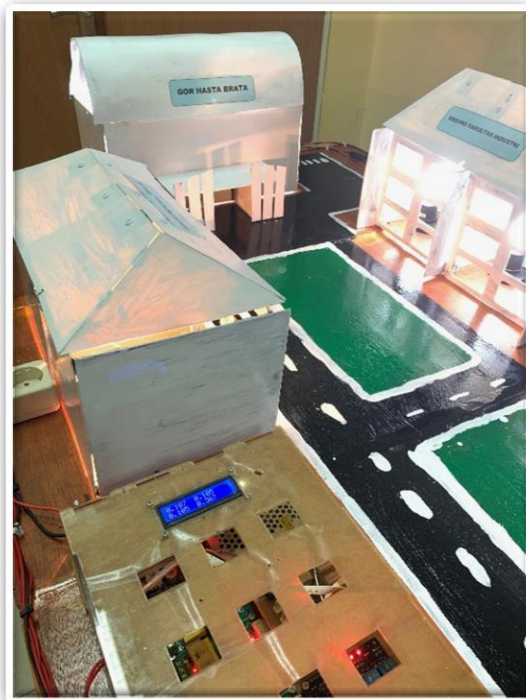
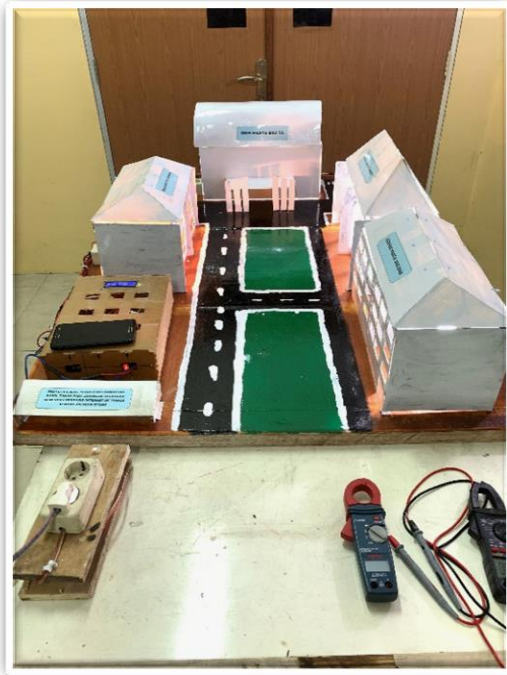
lcd.setCursor(7,1);
lcd.print(current4,3);
if(current4 >= current_threshold)
{
  digitalWrite(relay1,HIGH);
  digitalWrite(relay2,HIGH);
  digitalWrite(relay3,HIGH);
  digitalWrite(relay4,HIGH);
  Blynk.virtualWrite(V6,"Over Current! Gedung 4");
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print(" Over Current! ");
  lcd.setCursor(0,1);
  lcd.print("  Gedung 4  ");
  error = HIGH;
}
} else {
  Serial.println("Error reading current gedung 4");
}
}

isconnected = Blynk.connected();
if (isconnected == true) {
  digitalWrite(WIFI_LED, HIGH);
  Serial.println("Blynk Connected");
}
else{
  digitalWrite(WIFI_LED, LOW);
  Serial.println("Blynk Not Connected");
}
Serial.println();
delay(500);
}

```

LAMPIRAN 2

Foto Dokumentasi Penelitian



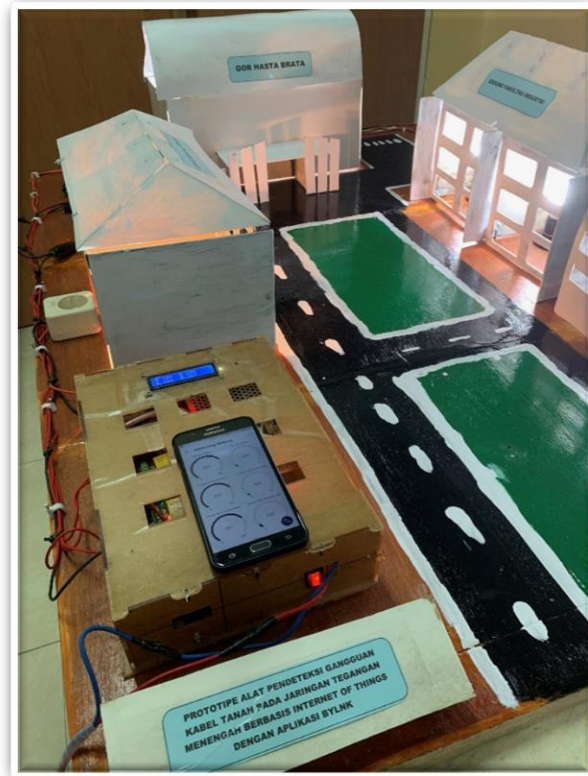


Foto Mock UP tampak dari Atas

LAMPIRAN 3

Data Sheet Pengujian Beban

No	Nama Gedung	Skema	Beban	Pengujian	Alat Ukur					
					Watt	Avometer		Clamp Meter		Blynk
			Tegangan			Arus	Tegangan	Arus	Tegangan	Arus
1	Gedung Pasca Sarjana	1	30	1	221	0.178	218	0.175	221	0.176
				2	218	0.179	221	0.177	218	0.174
				3	220	0.179	223	0.178	220	0.178
				4	223	0.175	223	0.176	223	0.172
				5	220	0.177	222	0.178	220	0.174
		2	15	1	219	0.093	220	0.091	219	0.09
				2	219	0.091	223	0.09	219	0.091
				3	218	0.094	218	0.09	218	0.089
				4	220	0.091	225	0.092	220	0.092
				5	223	0.091	220	0.092	223	0.091
2	Gedung Fakultas Industri	1	55	1	220	0.276	219	0.277	220	0.277
				2	223	0.277	225	0.278	223	0.278
				3	223	0.275	226	0.274	223	0.276
				4	223	0.276	218	0.277	223	0.277
				5	222	0.275	225	0.278	222	0.279
		2	40	1	219	0.18	225	0.181	219	0.182
				2	220	0.183	221	0.18	220	0.181
				3	219	0.181	223	0.183	219	0.183
				4	221	0.183	219	0.184	221	0.184
				5	224	0.181	226	0.18	224	0.18
3	Gedung Fakultas Kesehatan	1	80	1	223	0.361	221	0.362	223	0.36
				2	219	0.362	221	0.365	219	0.362
				3	224	0.361	225	0.36	224	0.361
				4	221	0.362	222	0.364	221	0.363
				5	223	0.361	226	0.363	223	0.362
		2	40	1	222	0.183	225	0.185	222	0.183
				2	224	0.181	221	0.18	224	0.182
				3	219	0.18	225	0.182	219	0.18
				4	221	0.181	224	0.181	221	0.181
				5	221	0.181	222	0.183	221	0.182
4	GOR Hasta Brata	1	20	1	223	0.166	218	0.165	223	0.165
				2	220	0.163	223	0.161	220	0.164
				3	222	0.164	222	0.163	222	0.166
				4	218	0.166	220	0.167	218	0.165
				5	225	0.168	223	0.168	225	0.166
		2	10	1	223	0.083	226	0.082	223	0.084
				2	222	0.084	219	0.083	222	0.084
				3	219	0.082	226	0.081	219	0.082
				4	222	0.083	223	0.08	222	0.083
				5	218	0.082	223	0.081	218	0.082

*Pengambilan Data dilaksanakan pada Tanggal 04 Juli 2023