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# LAMPIRAN A

## Pengerjaan Mekanik



Pengukuran Besi



Pemotongan Besi





## LAMPIRAN B

### Pengukuran Kecepatan Motor dan Pengambilan Data Tegangan dan Arus

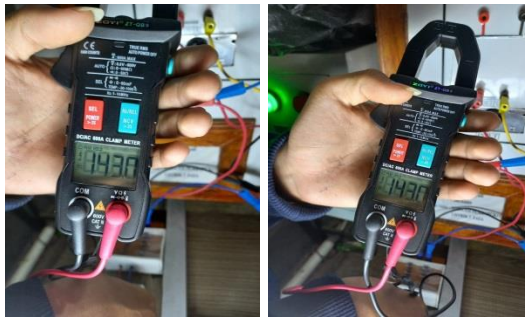
#### Pengujian Alat



#### Pengukuran Kecepatan Motor



## Proses Pengambilan Data Tegangan



## Proses Pengambilan Data Arus





## LAMPIRAN LISTING PROGRAM

### monitoring pzem-017

```
#include <SoftwareSerial.h>#include <Wire.h>
#include <LiquidCrystal_I2C.h>#include <ESP8266WiFi.h>
SoftwareSerial PZEMSerial; #include <ModbusMaster.h>
#define WDT_TIMEOUT 10000#define MAX485_DE 16
//D0 #define MAX485_RE 13 //D7 #define buttonPin 12
//D6
#define UPDATE_INTERVAL_HOUR (0)
#define UPDATE_INTERVAL_MIN (10)
#define UPDATE_INTERVAL_SEC (0)
#define UPDATE_INTERVAL_MS (
((UPDATE_INTERVAL_HOUR*60*60) +
(UPDATE_INTERVAL_MIN * 60) +
UPDATE_INTERVAL_SEC ) *1000 )
//inisialisasi wifi
char ssid[] = "Andromax-M3Y-F2EC";char pass[] =
"30458259";
String GAS_ID =

"AKfycbz9xjeSANS5GMbbMBuvS46CeGVuVqaejrXkVmJE
yPNyUtq4 xSF4XSIYaXuNGdONIlcCuQ";
ModbusMaster node; LiquidCrystal_I2C lcd(0x27, 16, 2);
const char* host = "script.google.com";static uint8_t
pzemSlaveAddr = 0x01;
static uint16_t NewshuntAddr = 0x0000; //variabel simpan
data sensorfloat PZEMVoltage = 0;
float PZEMCurrent = 0;float PZEMPower = 0;

float PZEMEnergy = 0; unsigned long startMillisPZEM;
unsigned long currentMillisPZEM;
const unsigned long periodPZEM = 1000;unsigned long
startMillisReadData; unsigned long currentMillisReadData;
const unsigned long periodReadData = 1000;int ResetEnergy
= 0;
int a = 1;
```

```

unsigned long startMillis1; unsigned long time_ms;
unsigned long time_1000_ms_buf; unsigned long
time_sheet_update_buf; unsigned long time_dif;
void setup()
{
ESP.wdtEnable(WDT_TIMEOUT); startMillis1 = millis();
Serial.begin(115200); Serial.print("Connecting to ");
Serial.println(ssid); WiFi.begin(ssid, pass);
while (WiFi.status() != WL_CONNECTED) { delay(1000);
Serial.println("...");
}
Serial.println("Connected to WiFi");
PZEMSerial.begin(9600, SWSERIAL_8N2, 14, 0); //D5=RO
D3=DI
startMillisPZEM = millis(); pinMode(MAX485_RE, OUTPUT);
pinMode(MAX485_DE, OUTPUT);
digitalWrite(MAX485_RE, 0);
digitalWrite(MAX485_DE, 0);
node.preTransmission(preTransmission);
node.postTransmission(postTransmission);

node.begin(pzemSlaveAddr, PZEMSerial); delay(1000);
startMillisReadData = millis(); lcd.init();
lcd.backlight(); lcd.setCursor(0, 0);
lcd.print("WATTMETER DC"); lcd.setCursor(0, 1);
lcd.print("TEST HARDWARE"); delay(2000);
lcd.clear();
pinMode(buttonPin, INPUT); // set pin tombol sebagai input
}
void loop() {
int buttonState = digitalRead(buttonPin); // membaca status tombol if
(buttonState == LOW) { // jika tombol ditekan
hapus_data();
}
delay(150); if ((millis() - startMillis1 >= 10000) && (a == 1)) {
setShunt(pzemSlaveAddr);
changeAddress(0XF8, pzemSlaveAddr); a =
0;
}
}

```

```

}
currentMillisPZEM = millis();
if (currentMillisPZEM - startMillisPZEM >=
periodPZEM) { uint8_t result =
node.readInputRegisters(0x0000, 6);
if (result == node.ku8MBSuccess) { uint32_t
tempdouble = 0x00000000;
PZEMVoltage
= node.getResponseBuffer(0x0000)
/ 100.0;PZEMCurrent
= node.getResponseBuffer(0x0001)
/ 100.0;tempdouble
= (node.getResponseBuffer(0x0003) << 16)
+
node.getResponseBuffer(0x0002);
PZEMPower = tempdouble / 10.0;
tempdouble
= (node.getResponseBuffer(0x0005) << +
node.getResponseBuffer(0x0004);
PZEMEnergy = tempdouble;
}
startMillisPZEM = currentMillisPZEM ;
}
currentMillisReadData = millis();
if (currentMillisReadData - startMillisReadData >=
periodReadData) { Serial.print("Vdc : ");
Serial.print(PZEMVoltage); Serial.println(" V
");
");
Serial.print("Idc : "); Serial.print(

```

```

Wh ");
lcd.setCursor(0, 0);
lcd.print(PZEMCurrent);lcd.print("A");
lcd.setCursor(0, 1);
lcd.print(PZEMEnergy);
lcd.print("Wh");
lcd.setCursor(9, 0);
lcd.print(PZEMVoltage);lcd.print("V");
lcd.setCursor(9, 1);
lcd.print(PZEMPower); lcd.print("W");
startMillisReadData = millis();
}

```

### **kirim data**

```

Serial.print("Connecting to ");
Serial.println(host);
WiFiClientSecure
client; const int
httpPort = 443;
int retries = 5; // Number of connection
retriesclient.setInsecure();
while (!client.connect(host, httpPort))
{
Serial.print("Connection failed. Retries
left: ");Serial.println(retries);
if (--retries == 0) {
Serial.println("Max retries
exceeded.");return;
}
delay(1000); // Wait for a second before retrying
}
Serial.println("Connected to server");
String url = "/macros/s/" + GAS_ID +
"/exec?value1=";url += String(PZEMVoltage);

```

```

url += "&value2=";
url +=
String(PZEMCurrent);
url += "&value3=";
url += String(PZEMPower);url +=
"&value4=";
url += String(PZEMEnergy);
Serial.print("Requesting URL: ");
Serial.println(url);
client.print(String("GET ") + url + " HTTP/1.1\r\n" + "Host:
" + host + "\r\n" +
"Connection: close\r\n\r\n");Serial.println();
Serial.println("closing connection");
Serial.println(client.readString());
}
void hapus_data()
{
  Serial.print("Connecting to ");
  Serial.println(host); WiFiClientSecure client;
  const int httpPort = 443;
  int retries = 5; // Number of connection retries
  client.setInsecure();
  while (!client.connect(host, httpPort))
  {
    Serial.print("Connection failed. Retries left: ");
    Serial.println(retries);
    if (--retries == 0) {
      Serial.println("Max retries exceeded.");return;
    }
    delay(1000); // Wait for a second before
    retrying
  }
  Serial.println("Connected to server");
  String url = "/macros/s/" + GAS_ID +
"/exec?hapus";Serial.print("Requesting URL:
");
  Serial.println(url);
  // This will send the request to the server

```

```
client.print(String("GET ") + url + "  
HTTP/1.1\r\n"  
+  
"Host: " + host + "\r\n" +  
"Connection: close\r\n\r\n");  
Serial.println();  
Serial.println("closing  
connection");  
}  
if (millis() - time_sheet_update_buf >= UPDATE_INTERVAL_MS  
}
```



## BIODATA PENULIS



Nama : Dwi Hardika Satrio Pambudi  
Tempat/Tanggal Lahir : Banyumas 13 Maret 2001  
Agama : Islam  
Alamat : Desa Samudra Rt 02/ Rw 02, Kec. Gumelar,  
Kab. Banyumas, Provinsi Jawa Tengah  
Email : dwihardikasat@gmail.com  
Telepon/Hp : 082265433745  
Hobi : Adventure  
Motto : Berusaha Jadi Yang Terbaik  
Riwayat Pendidikan :

Sekolah / Institusi/ Universitas	Jurusan	Periode
SD Negeri 3 Gumelar	-	2007-2014
SMP Negeri 3 Gumelar	-	2014-2016
SMK Ma'rif Nu 1 Ajibarang	TKJ	2017-2020
Politeknik Negeri Cilacap	D3 Teknik Listrik	2021-2023

Penulis telah mengikuti seminar Tugas Akhir pada 7, Agustus, 2023 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md).