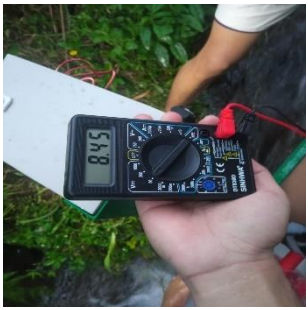
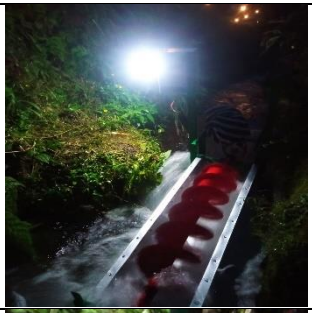
LAMPIRAN
PROSES PEMBUATAN MEKANIK ALAT

LAMPIRAN A

a. Pembuatan Rangkaian Turbin Angin

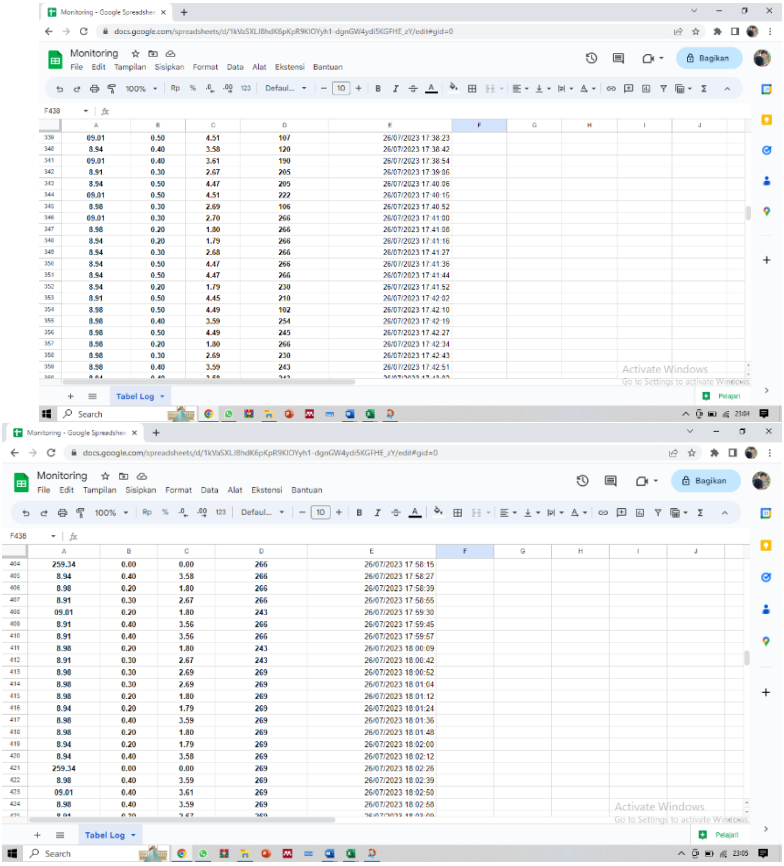
	
	
	

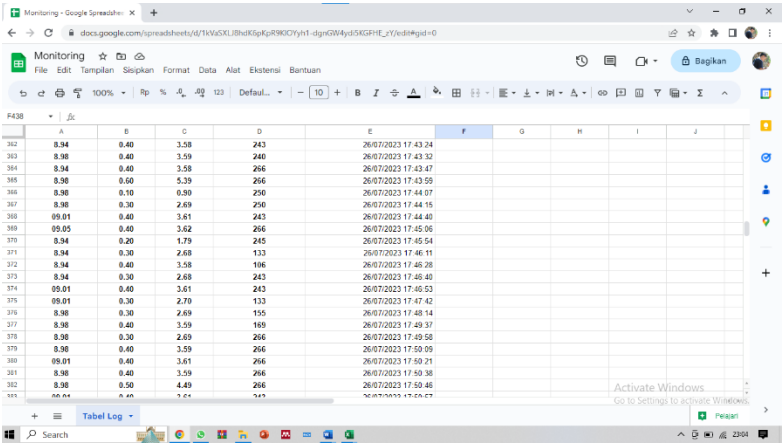
b. Pengambilan Data Daya, Arus, dan Tegangan

c. Pembacaan pengukuran Real Time Tampilan Google Spreadsheet





	A	B	C	D	E
362	8.94	0.40	3.58	243	26/07/2023 17:43:24
363	8.98	0.40	3.59	240	26/07/2023 17:43:32
364	8.94	0.40	3.58	266	26/07/2023 17:43:47
365	8.98	0.60	5.39	266	26/07/2023 17:43:59
366	8.98	0.10	0.90	250	26/07/2023 17:44:07
367	8.98	0.30	2.69	250	26/07/2023 17:44:15
368	09.01	0.40	3.61	243	26/07/2023 17:44:40
369	09.05	0.40	3.62	266	26/07/2023 17:45:06
370	8.94	0.20	1.79	245	26/07/2023 17:45:54
371	8.94	0.30	2.68	133	26/07/2023 17:46:11
372	8.94	0.40	3.58	106	26/07/2023 17:46:28
373	8.94	0.30	2.68	243	26/07/2023 17:46:40
374	09.01	0.40	3.61	243	26/07/2023 17:46:53
375	09.01	0.30	2.70	133	26/07/2023 17:47:42
376	8.98	0.30	2.69	155	26/07/2023 17:48:14
377	8.98	0.40	3.59	169	26/07/2023 17:49:37
378	8.98	0.30	2.69	266	26/07/2023 17:49:58
379	8.98	0.40	3.59	266	26/07/2023 17:50:09
380	09.01	0.40	3.61	266	26/07/2023 17:50:21
381	8.98	0.40	3.59	266	26/07/2023 17:50:38
382	8.98	0.50	4.49	266	26/07/2023 17:50:46

LAMPIRAN B

```
#include <ESP8266WiFi.h>
#include <ESP8266HTTPClient.h>
#include <WiFiClientSecureBearSSL.h>
#include <Adafruit_INA219.h>

#include "certs.h"

#define LED_PIN 2 //D2
#define LM393_PIN 14//pin sensor speed

String serverName = "https://script.google.com/macros/s/AKfycbzbYlOOLwZ8NvrqoJNMHsgjI5hB0VR1M_gxuaBihorVrhu3Vy5Q1vYTpH6Cqh_VCith/exec";

const char ssid[]  = "TA2023";
const char pass[]  = "bisa1234";
float vVoltage, vCurrent, vPower, vSpeed, offsetRPM=1;;
unsigned long lastTime = 0, sendTime = 5000;
unsigned long speedTime= 0, vRpm=0;
unsigned long lastDisplayTime=0, displayTime=1000;
bool stateReady=false;

Adafruit_INA219 ina219;

void setup() {
  Serial.begin(9600); delay(100);
  Serial.println("Inisialisasi....");
  pinMode(LM393_PIN,INPUT_PULLUP);
  //attachInterrupt(digitalPinToInterrupt(LM393_PIN),count,RISING);
  if (! ina219.begin()) {
    Serial.println("Failed to find INA219 chip");
    while (1) {
      delay(10);
    }
  }
```

```
  pinMode(LED_PIN, OUTPUT); digitalWrite(LED_PIN, LOW);
  Serial.print("Connecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, pass);
  int count = 0;
  while (WiFi.status() != WL_CONNECTED) {
    Serial.print(".");
    digitalWrite(LED_PIN, HIGH); delay(250);
    digitalWrite(LED_PIN, LOW); delay(250);
    count++;
    if (count >= 20)ESP.restart();
  }
  Serial.println("Connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}

void loop() {
  vVoltage = ina219.getBusVoltage_V()*8.6;
  vCurrent = ina219.getCurrent_mA();
  vPower   = vVoltage*vCurrent;
  vRpm     = vRpm*offsetRPM;
//    vVoltage = random(1,100);vCurrent = random(1,100);vPower     =
random(1,100);
  if ((WiFi.status() != WL_CONNECTED)) {
    reconnecting();
  }
  else {
    if (millis() > lastTime + sendTime) {
      updateDB();
      lastTime = millis();
    }
  }
  if(millis() > lastDisplayTime + displayTime){
    Serial.println("Voltage\t: " + String(vVoltage) + " V");
    Serial.println("Current\t: " + String(vCurrent) + " mA");
    Serial.println("Power\t: " + String(vPower) + " W");
    Serial.println("Speed\t: " + String(vRpm) + " Rpm");
    Serial.println("=================================");
```

```
  }
  if(digitalRead(LM393_PIN)==LOW && stateReady == true){
    countRPM();
    stateReady=false;
  }
  if(digitalRead(LM393_PIN)==HIGH){
    stateReady=true;
  }
  delay(1);
}

void countRPM(){
  unsigned long endTime = millis();
  unsigned long duration = endTime-speedTime;
  vRpm = 60000/duration;
  speedTime = millis();
}
void reconnecting() {
  Serial.print("reConnecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, pass);
  int count = 0;
  while (WiFi.status() != WL_CONNECTED) {
    Serial.print(".");
    digitalWrite(LED_PIN, HIGH); delay(250);
    digitalWrite(LED_PIN, LOW); delay(250);
    count++;
    if (count >= 20)ESP.restart();
  }
  Serial.println("Connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}
void updateDB() {
  if ((WiFi.status() == WL_CONNECTED)) {
    std::unique_ptr<BearSSL::WiFiClientSecure>client(new
BearSSL::WiFiClientSecure);
    client->setInsecure();
```

```
    HTTPClient https;

    Serial.print("[HTTPS] begin...\n");
    String serverPath = serverName + "?i1=" + String(vVoltage) + "&i2="
+ String(vCurrent) + "&i3=" + String(vPower)+ "&i4=" + String(vRpm);
    Serial.println(serverPath);
    if (https.begin(*client, serverPath)) { // HTTPS

      Serial.print("[HTTPS] GET...\n");
      int httpCode = https.GET();
      if (httpCode > 0) {
        Serial.printf("[HTTPS] GET... code: %d\n", httpCode);
       if (httpCode == HTTP_CODE_OK || httpCode ==
HTTP_CODE_MOVED_PERMANENTLY) {
          //          String payload = https.getString();
          //          Serial.println(payload);
         Serial.println("OK");
        }
      } else {
        Serial.printf("[HTTPS] GET... failed, error: %s\n",
https.errorToString(httpCode).c_str());
      }

      https.end();
    } else {
      Serial.printf("[HTTPS] Unable to connect\n");
    }
  }
  else {
    Serial.println("CANNOT SEND TO GOOGLE SHEET ERROR WIFI
CONNECTION");
  }
}
```

BIODATA PENULIS

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Hobi	: bulutangkis dan traveling
Motto	: jangan takut, jangan menyerah, tetep berusaha.

Riwayat Pendidikan

- SD Negeri 04 Penggalang — Tahun 2006-2013
- SMP Negeri 2 kroya — Tahun 2013-2016
- SMK Negeri 1 Binangun — Tahun 2016-2019
  Jurusan Teknik Kendaraan Ringan
- Politeknik Negeri Cilacap — Tahun 2020-2023
  Prodi D3 Teknik Listrik

Penulis telah mengikuti seminar proposal pada tanggal 17 Juni 2022 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md)