

**LAMPIRAN**  
**PROSES PEMBUATAN MEKANIK ALAT**



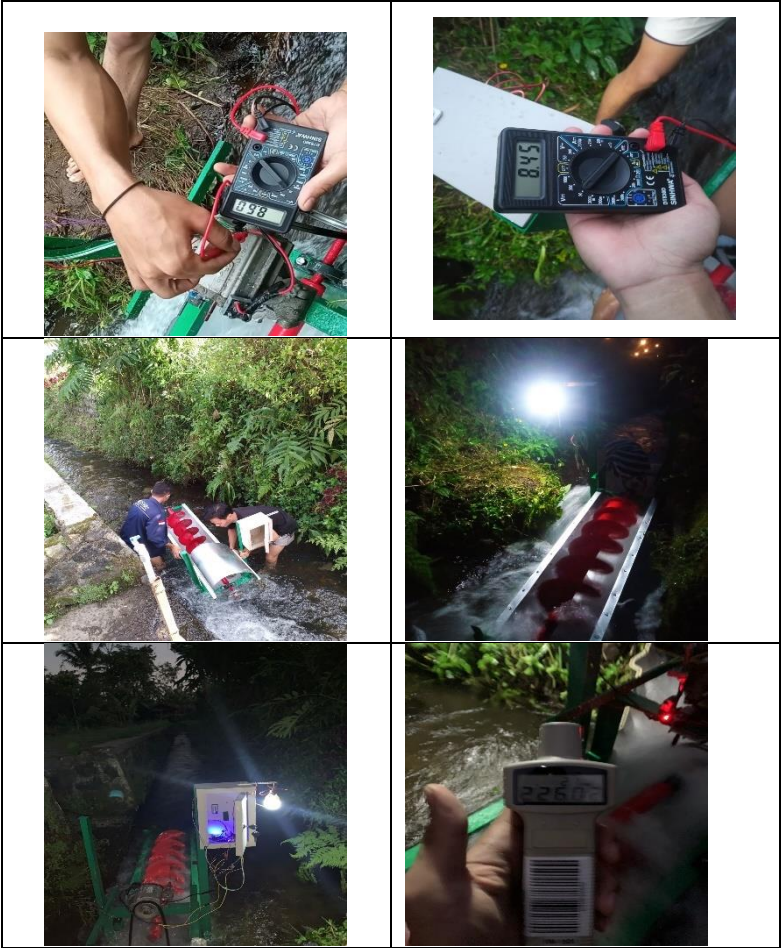
## LAMPIRAN A

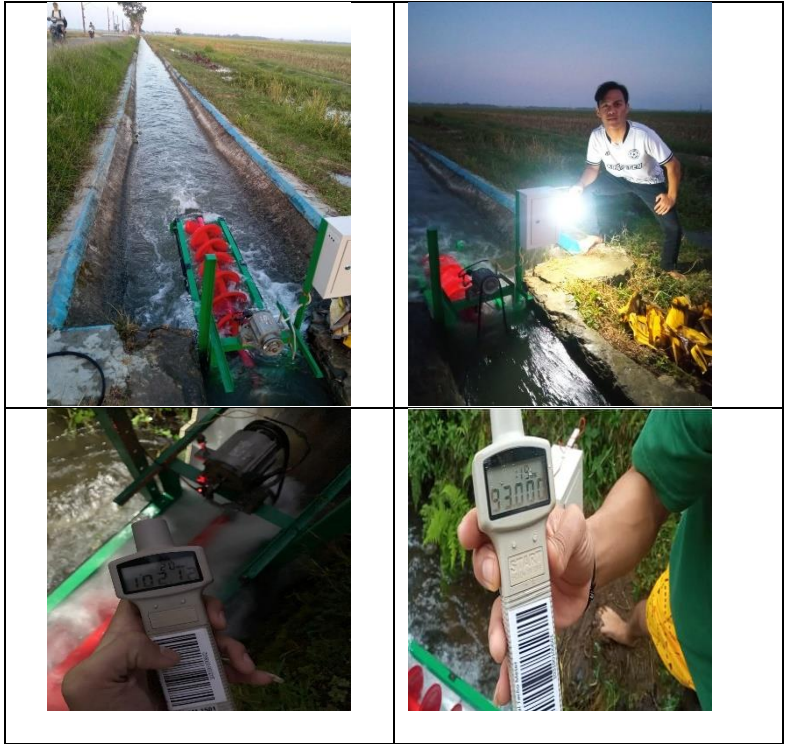
### a. Pembuatan Rangkaian Turbin Angin



b. Pengambilan Data Daya, Arus, dan Tegangan







## c. Pembacaan pengukuran Real Time Tampilan Google Spreadsheet

The image displays two screenshots of a Google Spreadsheet titled "Monitoring". The spreadsheet contains real-time monitoring data with columns labeled A through J. The data is organized into rows, with each row representing a specific time point. The top screenshot shows rows 338 to 366, and the bottom screenshot shows rows 404 to 424. The data includes numerical values for parameters A, B, C, D, and E, along with timestamps in column F.

**Top Screenshot Data (Rows 338-366):**

Row	A	B	C	D	E	F
338	09.01	0.50	4.51	107		26/07/2023 17:30:23
340	0.94	0.40	3.58	120		26/07/2023 17:30:42
341	09.01	0.40	3.61	109		26/07/2023 17:30:54
342	0.91	0.30	2.67	205		26/07/2023 17:30:06
343	0.94	0.50	4.47	205		26/07/2023 17:40:06
344	09.01	0.50	4.51	222		26/07/2023 17:40:15
345	0.96	0.30	2.69	106		26/07/2023 17:40:52
346	09.01	0.30	2.70	266		26/07/2023 17:41:00
347	0.96	0.20	1.80	266		26/07/2023 17:41:06
348	0.94	0.20	1.79	269		26/07/2023 17:41:16
349	0.94	0.30	2.68	266		26/07/2023 17:41:17
350	0.94	0.50	4.47	269		26/07/2023 17:41:36
351	0.94	0.50	4.47	266		26/07/2023 17:41:44
352	0.94	0.40	1.79	210		26/07/2023 17:41:52
353	0.91	0.50	4.45	210		26/07/2023 17:42:02
354	0.96	0.50	4.49	102		26/07/2023 17:42:10
355	0.96	0.40	3.59	254		26/07/2023 17:42:19
356	0.96	0.50	4.49	245		26/07/2023 17:42:27
357	0.96	0.20	1.80	266		26/07/2023 17:42:34
358	0.96	0.30	2.69	230		26/07/2023 17:42:43
359	0.96	0.40	3.59	243		26/07/2023 17:42:51
360	0.94	0.40	3.58	243		26/07/2023 17:42:51

**Bottom Screenshot Data (Rows 404-424):**

Row	A	B	C	D	E	F
404	259.34	0.00	0.00	266		26/07/2023 17:58:15
405	0.94	0.40	3.58	268		26/07/2023 17:58:27
406	0.96	0.20	1.80	265		26/07/2023 17:58:39
407	0.91	0.30	2.67	266		26/07/2023 17:58:06
408	09.01	0.20	1.80	243		26/07/2023 17:59:30
409	0.91	0.40	3.56	266		26/07/2023 17:59:45
410	0.91	0.40	3.56	265		26/07/2023 17:59:57
411	0.96	0.20	1.80	243		26/07/2023 18:00:09
412	0.91	0.30	2.67	243		26/07/2023 18:00:42
413	0.96	0.30	2.69	269		26/07/2023 18:00:52
414	0.96	0.30	2.69	269		26/07/2023 18:01:04
415	0.96	0.20	1.80	269		26/07/2023 18:01:12
416	0.94	0.20	1.79	269		26/07/2023 18:01:24
417	0.96	0.40	3.59	269		26/07/2023 18:01:36
418	0.96	0.20	1.80	269		26/07/2023 18:01:48
419	0.94	0.20	1.79	269		26/07/2023 18:02:00
420	0.94	0.40	3.58	269		26/07/2023 18:02:12
421	259.34	0.00	0.00	269		26/07/2023 18:02:26
422	0.96	0.40	3.59	269		26/07/2023 18:02:39
423	09.01	0.40	3.51	269		26/07/2023 18:02:50
424	0.96	0.40	3.59	269		26/07/2023 18:02:58
425	0.94	0.30	2.67	269		26/07/2023 18:03:03

Monitoring - Google Spreadsheet

docs.google.com/spreadsheets/d/1WASXLIhthKpR90OYrYt1-dpGdW4y5SGFHE\_XY/edit#gid=0

Monitoring

File Edit Tampilan Sisipkan Format Data Alat Eksternal Bantuan

100% Rp % Default

	A	B	C	D	E	F	G	H	I	J
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	256	26/07/2023 17:43:47					
365	8.96	0.60	3.59	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	196	26/07/2023 17:48:28					
373	8.94	0.30	2.88	243	26/07/2023 17:48:48					
374	09.01	0.40	3.61	243	26/07/2023 17:48:53					
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 17:49:56					
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	0.60	4.49	266	26/07/2023 17:50:46					
383	09.04	0.40	3.61	243	26/07/2023 17:56:27					

Activate Windows  
Go to Settings to activate Windows.

Pejabat

Search



## 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/AKfycbzbYIOOLwZ8NvrqoJNMHs
gjI5hB0VR1M_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



Nama : Rois Ridho Pangayom  
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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)