

Lampiran 1. Surat Permohonan Peminjaman Alat

Perihal : Permohonan Peminjaman Alat
Lampiran : -

Kepada Yth.
Kepala Laboratorium Pendidikan Teknik Elektro UNJ
di Tempat

Dengan hormat,

Yang bertanda tangan dibawah ini saya,

Nama : Putri Ramadhani Adam
NO Registrasi : 5115152457
Prodi : S1 Pendidikan Teknik Elektro
No. HP : 081807442125
Program Kegiatan : Penelitian Skripsi
Judul Penelitaan : Proteksi Motor Induksi Tiga Fasa dari Ketidakseimbangan Tegangan Sumber Berbasis Mikrokontroler Arduino Uno

Dengan ini, kami mengajukan permohonan untuk peminjaman :

1. 1 unit motor induksi 3 fasa dan 1 unit alat ukur multimeter digital
2. 1 unit box panel dan 2 unit kontaktor
3. 1 unit TOR (*Thermal Overload Relay*)
4. 1 unit MCB 10 A 3 fasa dan 1 unit MCB 10 A 1 fasa

Peminjaman dilaksanakan pada tanggal 1 Desember – 15 Februari 2019.

Demikian surat permohonan ini saya sampaikan. Atas perhatian dan izin yang diberikan saya ucapkan terima kasih.

Jakarta, 26 November 2019

Mengetahui,
Dosen Pembimbing

Drs. Purwanto Gendroyono, M.T.
NIP. 195711291983031001

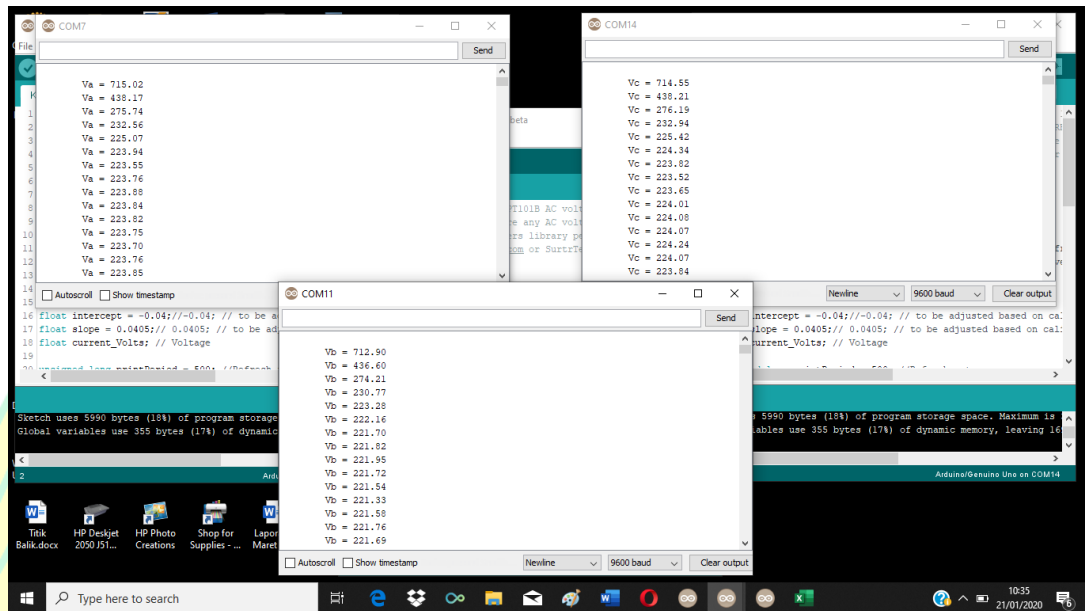
Peminjam

Putri Ramadhani Adam
NIM. 5115152457

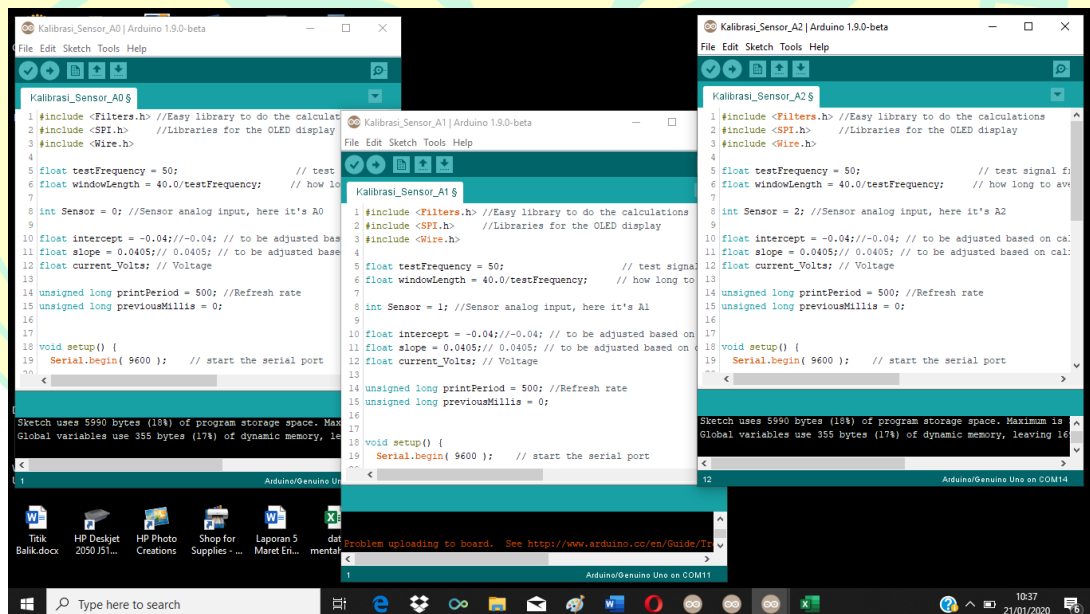
Menyetujui,
Koordinator Prodi S1 Pendidikan Teknik Elektro

Massus Subekti, S. Pd., M.T.
NIP. 197809072003121002

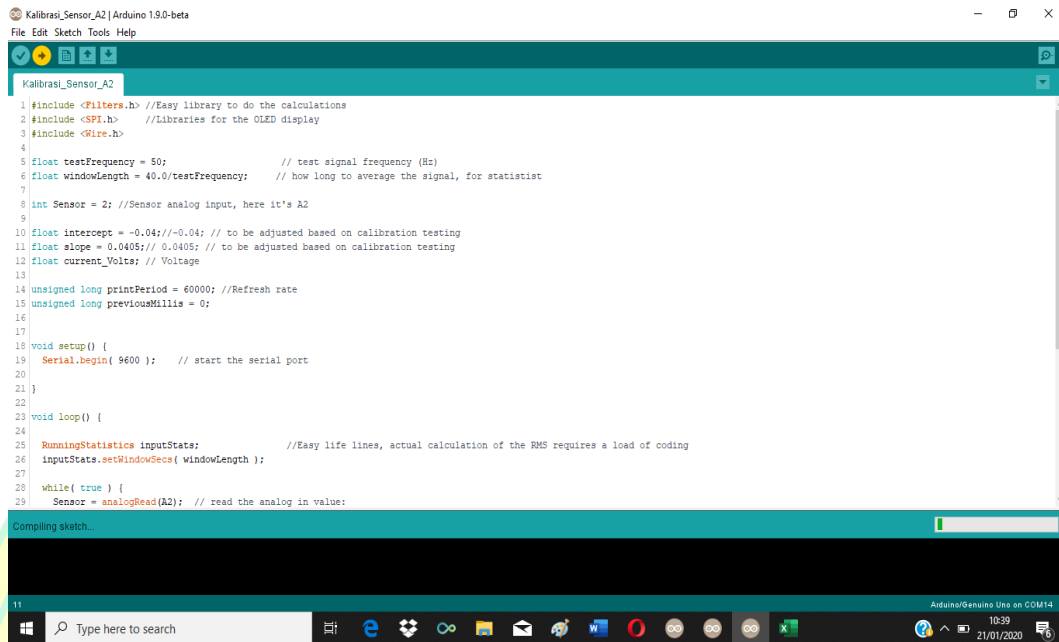
Lampiran 2. Dokumentasi Penelitian



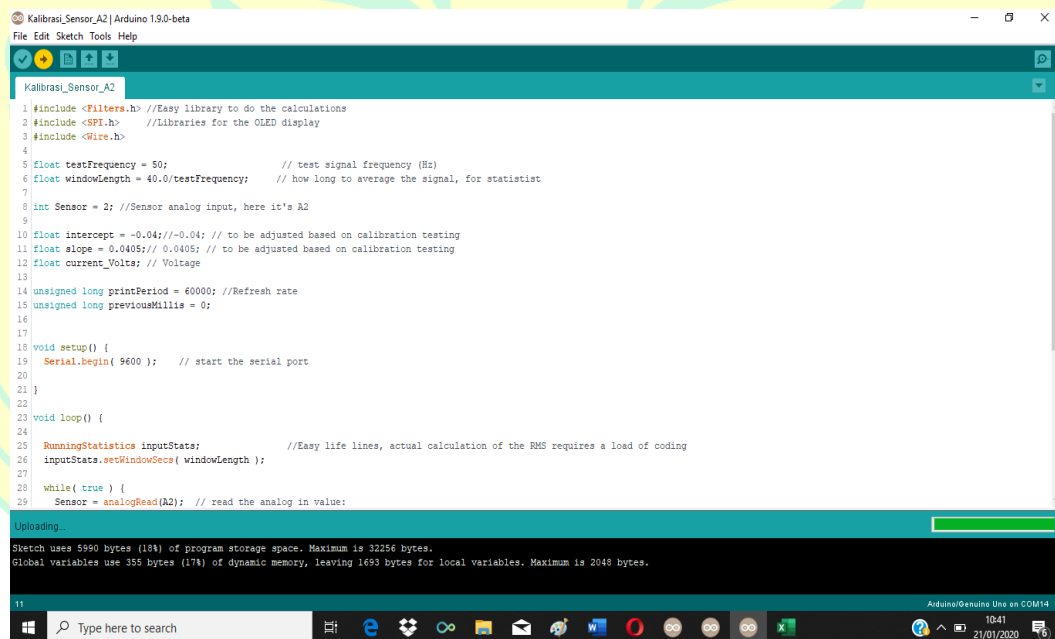
Gambar 1. Tampilan Serial Monitor Masing-masing Tegangan Fasa



Gambar 2. Tampilan Program Sistem Monitoring Tegangan 3 Fasa



Gambar 3. Tampilan Proses *Compiling* Pemrograman Arduino



Gambar 4. Tampilan Proses *Uploading* Pemrograman Arduino

```

1 #include <Filters.h> //Easy library to do the calculations
2 #include <SPI.h> //Libraries for the OLED display
3 #include <Wire.h>
4
5 float testFrequency = 50; // test signal frequency (Hz)
6 float windowLength = 40.0/testFrequency; // how long to average the signal, for statistist
7
8 int Sensor = 2; //Sensor analog input, here it's A2
9
10 float intercept = -0.04;//-0.04; // to be adjusted based on calibration
11 float slope = 0.0405;// 0.0405; // to be adjusted based on calibration testing
12 float current_Volts; // Voltage
13
14 unsigned long printPeriod = 60000; //Refresh rate
15 unsigned long previousMillis = 0;
16
17
18 void setup() {
19   Serial.begin( 9600 ); // start the serial port
20 }
21
22
23 void loop() {
24
25   RunningStatistics inputStats; //Easy life lines, actual calculation of the RMS requires a load of coding
26   inputStats.setWindowSecs( windowLength );
27
28   while( true ) {
29     Sensor = analogRead(A2); // read the analog in value:

```

Done uploading.

Sketch uses 5990 bytes (18%) of program storage space. Maximum is 32256 bytes.
Global variables use 355 bytes (17%) of dynamic memory, leaving 1693 bytes for local variables. Maximum is 2048 bytes.

Gambar 5. Tampilan Selesai Upload Pemrograman Arduino

```

COM7
Va = 216.24
Va = 217.89
Va = 217.35
Va = 217.79
Va = 218.22

COM14
V
Vc = 223.12
Vc = 222.63
Vc = 222.16
Vc = 224.01
Vc = 222.27

COM7
RunningStatistics in
inputStats.setWindow
Vb = 218.31
Vb = 219.96
Vb = 221.65
Vb = 222.10
Vb = 220.04

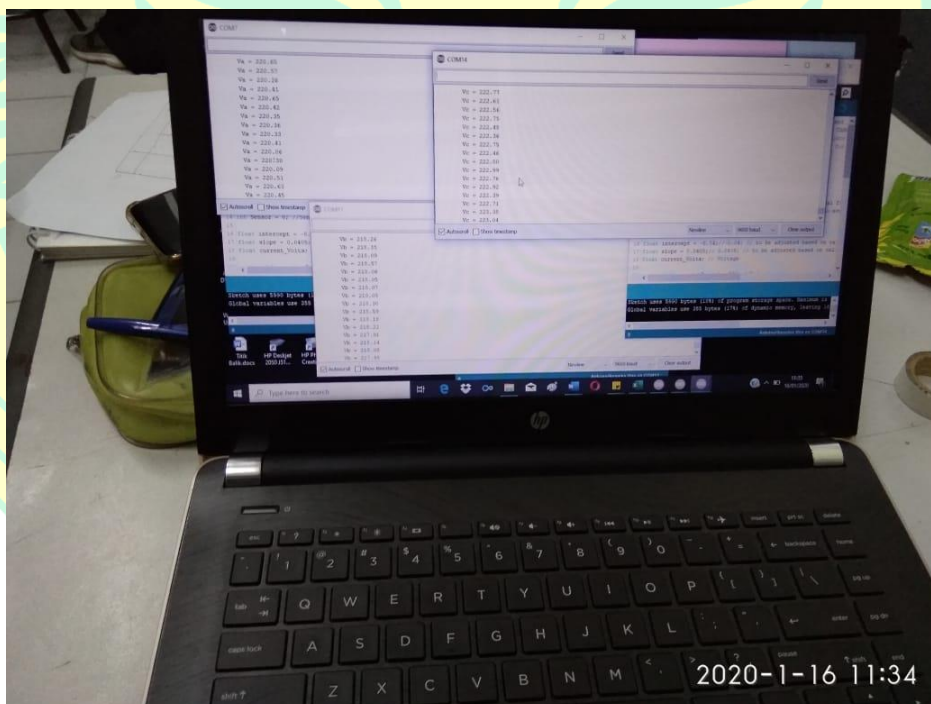
```

Sketch uses 5990 bytes (18%) of program storage space. Maximum is 32256 bytes.
Global variables use 355 bytes (17%) of dynamic memory, leaving 1693 bytes for local variables. Maximum is 2048 bytes.

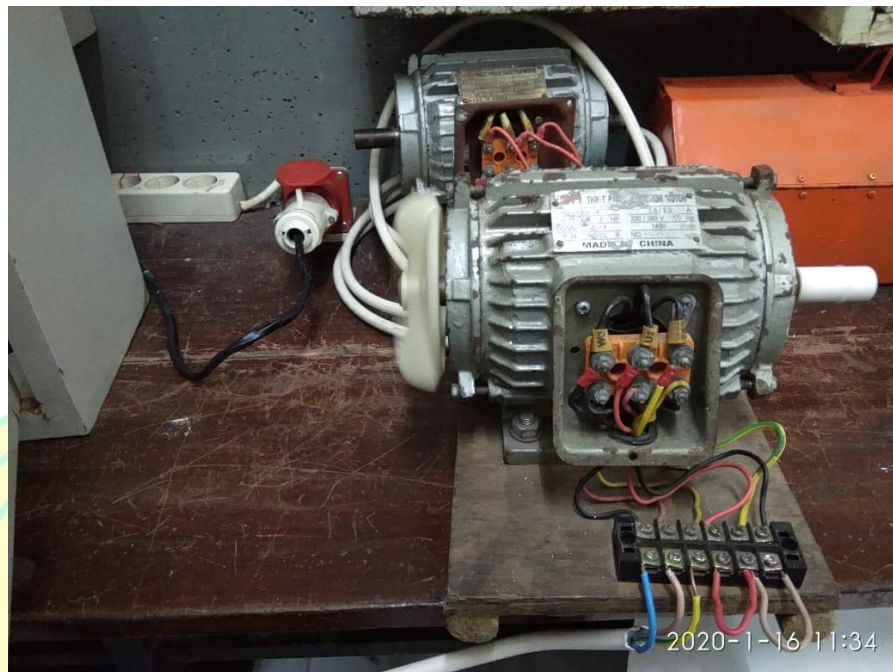
Gambar 6. Tampilan Pengujian Tiga Sensor Tegangan ZMPT101B



Gambar 7. Mikrokontroler Arduino Uno dan Sensor Tegangan ZMPT101B



Gambar 8. Tampilan Monitoring Tegangan Tiga Fasa pada Aplikasi Arduino IDE



Gambar 9. Motor Induksi Tiga Fasa



Gambar 10. Monitoring Suplai Tegangan pada Motor Induksi Tiga Fasa Secara Keseluruhan



(a)

(b)

(c)

Gambar 11. (a) Alat belum dinyalakan; (b) Kondisi ON; (c) Kondisi Trip



Gambar 12. Pengecekan Hasil Monitoring Alat

Lampiran 3. Program Alat

1. Arduino Uno dan Sensor Tegangan ZMPT101B (1)

```

#include <Filters.h> //Easy library to do the calculations

#include <SPI.h>

#include <Wire.h>

float testFrequency = 50; // test signal frequency (Hz)

float windowLength = 40.0/testFrequency; // how long to average the signal,
for statistist

int Sensor = 0; //Sensor analog input, here it's A0

float intercept = -0.04; // to be adjusted based on calibration testing
float slope = 0.0405; // to be adjusted based on calibration testing
float current_Volts; // Voltage

unsigned long printPeriod = 500; //Refresh rate
unsigned long previousMillis = 0;

void setup() {
  Serial.begin( 9600 ); // start the serial port
}

void loop() {
  RunningStatistics inputStats; //Easy life lines, actual calculation of the RMS
requires a load of coding
  inputStats.setWindowSecs( windowLength );
  while( true ) {
    Sensor = analogRead(A0); // read the analog in value:
    inputStats.input(Sensor); // log to Stats function
    if((unsigned long)(millis() - previousMillis) >= printPeriod) {
      previousMillis = millis(); // update time every second
      Serial.print( "\n" );
      current_Volts = intercept + slope * inputStats.sigma(); //Calibartions for offset
and amplitude
    }
  }
}

```



```

    current_Volts= current_Volts*(69.1916168); //Further calibrations for the
amplitude

    Serial.print( "\tVa = " );

    Serial.print( current_Volts );

}}}

```

2. Arduino Uno dan Sensor Tegangan ZMPT101B (2)

```

#include <Filters.h> //Easy library to do the calculations
#include <SPI.h>
#include <Wire.h>

float testFrequency = 50; // test signal frequency (Hz)

float windowLength = 40.0/testFrequency; // how long to average the signal,
for statistist

int Sensor = 1; //Sensor analog input, here it's A1

float intercept = -0.04; // to be adjusted based on calibration testing
float slope = 0.0405; // to be adjusted based on calibration testing

float current_Volts; // Voltage

unsigned long printPeriod = 500; //Refresh rate

unsigned long previousMillis = 0;

void setup() {
    Serial.begin( 9600 ); // start the serial port
}

void loop() {
    RunningStatistics inputStats; //Easy life lines, actual calculation of the RMS
requires a load of coding

    inputStats.setWindowSecs( windowLength );

    while( true ) {

        Sensor = analogRead(A1); // read the analog in value:

        inputStats.input(Sensor); // log to Stats function

        if((unsigned long)(millis() - previousMillis) >= printPeriod) {

```

```

    previousMillis = millis(); // update time every secon
Serial.print( "\n" );

    current_Volts = intercept + slope * inputStats.sigma(); //Calibartions for offset
and amplitude

    current_Volts= current_Volts*(69.1916168)/(54.0231); //Further
calibrations for the amplitude

    Serial.print( "\tVb = " );
    Serial.print( current_Volts );
}}}

```

3. Arduino Uno dan Sensor Tegangan ZMPT101B (3)

```

#include <Filters.h> //Easy library to do the calculations
#include <SPI.h>
#include <Wire.h>

float testFrequency = 50; // test signal frequency (Hz)
float windowLength = 40.0/testFrequency; // how long to average the signal,
for statistist
int Sensor = 2; //Sensor analog input, here it's A2
float intercept = -0.04; // to be adjusted based on calibration testing
float slope = 0.0405; // to be adjusted based on calibration testing
float current_Volts; // Voltage
unsigned long printPeriod = 500; //Refresh rate
unsigned long previousMillis = 0;
void setup() {
    Serial.begin( 9600 ); // start the serial port
}
void loop() {

    RunningStatistics inputStats; //Easy life lines, actual calculation of the RMS
requires a load of coding

    inputStats.setWindowSecs( windowLength );
    while( true ) {

```

```
Sensor = analogRead(A2); // read the analog in value:
inputStats.input(Sensor); // log to Stats function
if((unsigned long)(millis() - previousMillis) >= printPeriod) {
    previousMillis = millis(); // update time every second
Serial.print( "\n" );

    current_Volts = intercept + slope * inputStats.sigma(); //Calibartions for offset
and amplitude

    current_Volts= current_Volts*(69.1916168)/(54.0231); //Further
calibrations for the amplitude

Serial.print( "\tVc = " );
Serial.print( current_Volts );
}}}
```



RIWAYAT HIDUP



Putri Ramadhani Adam, akrab disapa dengan sebutan *Princess* atau Putri. Anak pertama dari dua bersaudara dari pasangan Bapak Kasdam dan Ibu Aah Mut'ah. Bertempat tinggal di Desa Karangmuncang, RT 07/RW 03 Dusun Pahing, Kecamatan Cigandamekar, Kuningan, Jawa Barat.

Riwayat Pendidikan, penulis menyelesaikan Pendidikan Sekolah Dasar di SD Negeri 2 Karangmuncang tahun 2009, pendidikan Sekolah Menengah Pertama di SMP Negeri 1 Cilimus tahun 2012, dan Sekolah Menengah Atas di SMA Negeri 1 Cilimus tahun 2015. Kemudian pada tahun 2015 melanjutkan studi di Universitas Negeri Jakarta, Fakultas Teknik, Jurusan Teknik Elektro, Program Studi Pendidikan Teknik Elektro melalui jalur Mandiri.

Riwayat Organisasi, penulis telah mengikuti beberapa organisasi yang berada di Jurusan Teknik Elektro dan Fakultas Teknik Universitas Negeri Jakarta diantaranya menjadi staff PSDM (Pengembangan Sumber Daya Mahasiswa) BEMP Pendidikan Teknik Elektro 2016-2017, Staff Kemuslimahan (Annisa) FSI Al-Biruni 2016-2017, Kepala Departemen PSDM (Pengembangan Sumber Daya Mahasiswa) 2017-2018, Sekretaris I BEM FT UNJ 2018-2019 dan Kepala Divisi Internal Forum Perempuan Fakultas Teknik Universitas Negeri Jakarta 2018-2019.

Pengalaman Mengajar, selama berkuliah, penulis telah melaksanakan Praktek Kegiatan Mengajar di SMK Kemala Bhayangkari 1 Jakarta pada bulan Agustus 2018 – November 2018.

Pengalaman Bekerja, selama berkuliah penulis telah melaksanakan Praktik Kerja Lapangan di PT PLN (Persero) Distribusi Jakarta Raya Area Lenteng Agung pada tanggal 22 Januari 2018 – 28 Februari 2018.