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Lampiran A
Program

```
#include <Wire.h>
#include <Adafruit_INA219.h>
#include <LiquidCrystal_I2C.h>


const int teganganIN = A2;
const int teganganOUT = A1;
String dataSerial;
int tegIN;
float tegOUT;

float tegangan1;
float nilaiarus1 = 0;
float adcTegIN;
int adcTegOUT;
unsigned long pref = 0;
int pinPWM = 6;
int PWM;
int SET = 12;//seting setpoint output
int voltase;
double pwmConvert;
float current_mA = 0;
LiquidCrystal_I2C lcd(0x23, 20, 4);
Adafruit_INA219 ina219;
void setup() {
  Serial.begin(9600); //baud komunikasi serial monitor 9600bps
  ina219.begin();

  pinMode(teganganIN, INPUT);
  pinMode(teganganOUT, INPUT);
  pinMode(pinPWM, OUTPUT);
  lcd.begin();
```

```
}

void data_olah() {
  current_mA = ina219.getCurrent_mA() / 1000;
  adcTegIN = analogRead(teganganIN);
  tegIN = maping(adcTegIN, 0, 782 , 0 , 19.2);
  voltase = map(PWM, 0, 255, 0, tegIN);
  if (voltase <= 0) {
    tegOUT - 1.0;
  }
  else {
    tegOUT = voltase + 1.0;
  }
  if (voltase > SET) {
    analogWrite(pinPWM, PWM);
    PWM --;
  }
  else if (voltase < SET) {
    analogWrite(pinPWM, PWM);
    PWM ++;
  }
  if (PWM > 255) {
    PWM = 255;
  }
  else if (PWM < 0) {
    PWM = 0;
  }
}

void show() {
  lcd.setCursor(0, 0);
  lcd.print("V_in  =" + String(tegIN) + "V ");
  lcd.setCursor(0, 1);
  lcd.print("I_OUT =" + String(current_mA) + "A ");
  lcd.setCursor(0, 2);
  lcd.print("PWM   =" + String(PWM) + " ");
  lcd.setCursor(0, 3);
  lcd.print("V_OUT =" + String(tegOUT) + "V ");
}
```

```
void loop() {
//================================================
================

   if (Serial.available() > 0) {
     dataSerial = Serial.readStringUntil('\n');
   }

   SET = dataSerial.toInt();

//================================================
================
  data_olah();
  if ((millis() - pref) > 1000) {
    show();
    Serial.print(" I OUT=" + String(current_mA) + "A");
    Serial.print(" teg in= " + String(tegIN) + "V");
    Serial.print(" teg out= " + String(tegOUT) + "V");
    Serial.print(" PWM=" + String(PWM));
    Serial.print(" ADC tegIN=" + String(adcTegIN));
    Serial.print(" ADC tegOUT=" + String(adcTegOUT));
    Serial.print(" voltase=" + String(voltase));

    Serial.println(" ");
    pref = millis();
  }
}

float maping(long x, long fromLow, long fromHigh, float toLow, float
toHigh)
{
  return (x - fromLow) * (toHigh - toLow) / (fromHigh - fromLow) +
toLow;
}
```

Lampiran B
Dokumentasi pribadi

B-3

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Hobi	:	Mendaki, sepakbola, badminton, berenang, futsal
Motto	:	Hiduplah dengan kepercayaan kepada diri sendiri jangan berharap kepada orang lain
Kontak person		
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SMP N 7 Cilacap	:	2013-2016
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