

LAMPIRAN – LAMPIRAN

Lampiran 1. Program MPPT P&O dan Kendali PI pada Konverter TLBC

```
#include <STM32F4ADC.h>
#define S1 PB0
#define S2 PB6

double D, VA, VAT, VAC, VATpref, DeltaVA, PA, PAT, PAC, PATpref,
DeltaPA, iref, Ierr_new, INT_new, INT_old, Ierr_old, Diref =0.01;
double IA=0.00;
int mod,n;
const int setOverflow = 3360;
double kp      = 10;
double ki      = 100;
double p,i,pi;
int count1,count2;
int car1,car2;

void setup()
{
  Serial.begin(9600);

  Timer8.init();
  Timer8.pause();
  Timer8.setMasterMode(TIMER_MASTER_MODE_UPDATE);
  Timer8.setPeriod(500);
  Timer8.setMode(TIMER_CH2, TIMER_OUTPUT_COMPARE);
  Timer8.setCompare(TIMER_CH2, 1);
  Timer8.attachInterrupt(TIMER_CH2,PnO);
  Timer8.refresh();
  Timer8.resume();

  Timer1.init();
  Timer1.pause();
  Timer1.setMasterMode(TIMER_MASTER_MODE_UPDATE);
  Timer1.setPeriod(2000);
  Timer1.setMode(TIMER_CH2, TIMER_OUTPUT_COMPARE);
  Timer1.setCompare(TIMER_CH2, 1);
  Timer1.attachInterrupt(TIMER_CH2,Cont);
  Timer1.refresh();
  Timer1.resume();

  Timer2.init();
  Timer2.pause();
```

```

Timer2.setMasterMode(TIMER_MASTER_MODE_UPDATE);
Timer2.setPeriod(1000);
Timer2.setMode(TIMER_CH2, TIMER_OUTPUT_COMPARE);
Timer2.setCompare(TIMER_CH2, 1);
Timer2.attachInterrupt(TIMER_CH2,INT1);
Timer2.refresh();
Timer2.resume();

Timer3.init(); //PWM timer (PB0)
Timer3.setPeriod(20);
Timer3.refresh();

Timer4.init(); //(PB6)
Timer4.setPeriod(20);
Timer4.refresh();
Timer4.setCount(1680);

Timer3.resume();
Timer4.resume();

pinMode(PB6,PWM);
pinMode(PB0,PWM);
pinMode(PA0, INPUT_ANALOG);// VOLTAGE SENSOR (TIMER 1)
pinMode(PA1, INPUT_ANALOG);// CURRENT SENSOR (TIMER 2)
}
void INT1()
{
  Serial.print(VA);
  Serial.print(" ");
  Serial.print(IA);
  Serial.print(" ");
  Serial.println(iref);
  //Serial.print(" ");
  //Serial.println(mod);
}

void loop()
{
  count1 = Timer3.getCount();
  count2 = Timer4.getCount();
  car1 = count1;
  car2 = count2;

  pwmWrite(PB0, mod);
  pwmWrite(PB6, mod);

```

```

    }
void PnO ()
{
VA  = analogRead(PA0)/53.783;//+-50 ->54
IA  = analogRead(PA1)/780.012;//+-770 ->814
PA =VA*IA;

n++;
PAC=PAC+PA;
VAC=VAC+VA;

if(n>=400)
{
n=0;
PAT=PAC;
PAC=0;
VAT=VAC;
VAC=0;

DeltaVA=VAT-VATpref;
DeltaPA=PAT-PATpref;

if (DeltaPA>0){
if (DeltaVA>0){
D=D-Diref;
}
else if(DeltaVA<0){
D=D+Diref;
}
}

else if(DeltaPA<0){
if (DeltaVA<0){
D=D-Diref;
}
else if(DeltaVA>0){
D=D+Diref;
}
}

if(D>4.1){
D=4.1;//batas maksimal
}
else if(D<0.1){
D=0.1;//batas minimal
}
VATpref = VAT;

```

```
PATpref= PAT;

}
}
void Cont ()
{
iref = D;
Ierr_new= iref-IA;//error
//Proportional Integral control
INT_new =(Ierr_new + Ierr_old)+ INT_old;
mod = ki*INT_new + kp*Ierr_new;
Ierr_old = Ierr_new;
if ( mod >0 && mod<3360)
{
INT_old = INT_new;
}
}
```



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