

1. karena potensiometer untuk mengitung setpoint sehingga dapat mendapatkan nilai error nilai error jika sudah dapat bisa mendapatkan nilai derivative dan integral jika

kp=4 ki=1 kd=8 potensiometer di seting max = 1015 maka

nilai error = 1015 – 0 derivative

= 1015 – lasterror integral =

integral + 1015; lastError =

error;

int pid = (kp * error) + (kd * derivative) + (ki * integral); hasilnya

int pid = (4 * 1015) + (8 * 1015) + (1 * 1015); int

pid = (4060) + (8120) + (1015);

sehingga pid = 13,195

jadi hal saya ubah hanya analogRead(A0)/4

lalu saya ubah mengikuti modul kp=20 ki=20 kd=5

potensiometer di seting max = 253

maka

nilai error = 253 – 0 derivative

= 253 – lasterror integral =

integral + 253; lastError =

error;

int pid = (kp * error) + (kd * derivative) + (ki * integral); hasilnya

int pid = (4 * 253) + (8 * 253) + (1 * 253);

int pid = (1012) + (2024) + (253); sehingga

pid = 3289

2. <https://www.tinkercad.com/things/jLFdMeXtA37-incredibleelzing/editel?sharecode=YcQjJ8XOdbNOYhFb8E5kDUF94SwfGnSvqCWeHrxqYQc>

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tinkercad.com/things/JJFdMeXA37-incredible-elzing/edit?tenant=circuits

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Text 1 (Arduino Uno R3)

```
1 float kp = 20, ki = 20, kd = 5; //Konstanta
2 int setpoint = 0; //Setpoint awal
3 int pv = 0; //PV awal = 0;
4 float integral = 0, derivative = 0;
5 int lastError = 0;
6 void setup()
7 {
8   Serial.begin(9600);
9   Serial.print(setpoint); Serial.print(" "); //Plot Setpoint Awal
10  Serial.print(pv); Serial.print(", "); //Plot Present Value Awal
11 }
12
13 void loop()
14 {
15   setpoint = analogRead(A0)/4; // Atur Setpoint dengan Potensiometer di
16   int error = setpoint-pv; //Hitung Error
17   derivative = error - lastError; //Hitung Rate / Derivative
18   integral = integral + error; //Hitung Integral
19   lastError = error; //Simpan Error Terakhir
20   int pid = (kp * error) + (kd * derivative) + (ki * integral); //
21
22   //--- Profile Actuator / Plant System ---/
23   int out = map(pid, -1023, 1023, -50, 50);
24   if(out>50) out = 50;
25   if(out<-50) out = -50;
26   pv = pv + out;
27   //--- End Profile Actuator / Plant System ---/
28
29   //Plot bentuk respon/
30   Serial.print(setpoint); Serial.print(" "); //Plot Setpoint
31   Serial.print(pv); Serial.print(", "); //Plot Present Value respon
32   Serial.println();
33   Serial.println(pid);
34 }
35
```

Serial Monitor

190, 258, 218, 253, 248, -190, 253, 258, 218, 253

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