

PID Tuning



WECON Technology Co., Ltd.

Website: <http://www.we-con.com.cn/en>

Technical Support: liux@we-con.com.cn

Skype: "fcwkkj" or "Jason.chen842"

QQ group: [465230233](https://www.qq.com/group/465230233)

Phone: [86-591-87868869](tel:86-591-87868869)

Technical forum: <http://wecon.freeforums.net/>

General

A proportional–integral–derivative is a control loop feedback mechanism commonly used in industrial control systems. PID control continuously calculates an error value as the difference between a measured process variable and a desired set point.

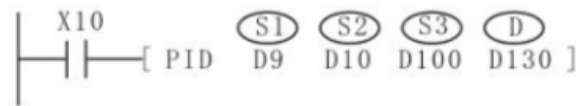
P accounts for present values of the error (e.g. if the error is large and positive, the control variable will be large and negative).

I accounts for past values of the error (e.g. if the output is not sufficient to reduce the size of the error, the control variable will accumulate over time, causing the controller to apply a stronger action).

D accounts for possible future values of the error, based on its current rate of change.

In this project, it contains 2 control modes and 2 output modes.

Command



S1: target value

S2: current value

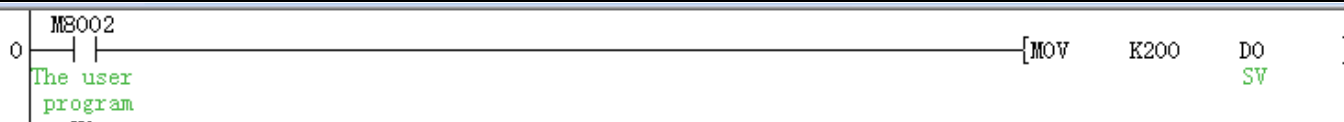
S3: operation parameter

D: destination device

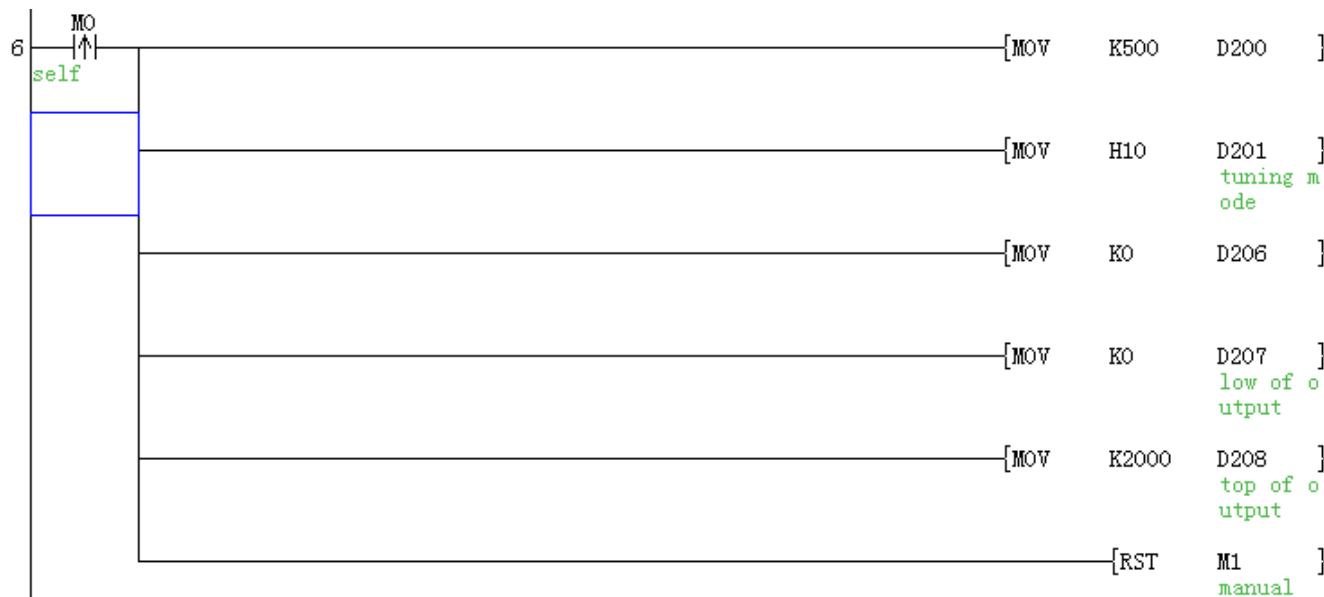
Operation parameter(S3+N)		
Unit	Function	Description
S3	Sample time(Ts)	Setting range 1~32767(ms), but must longer than scanning cycle of plc program
S3+1	Reaction direction(ACT)	bit0: 0=positive action; 1=negative action; bit3: 0=one way; 1=two way; bit4: 0=disable self-tuning; 1=enable self-tuning; Others cannot be used.
S3+2	Maximum climbing(Delta T)	Setting range 0~320
S3+3	Proportional gain(Kp)	Setting range: 0~32767, note:this value is magnified 256 times, actual value is Kp/256
S3+4	Integral gain(Ki)	Setting range: 0~32767, Ki=16384Ts/Ti, Ti is integral time
S3+5	Derivative gain(Kd)	Setting time: 0~32767, Kd≈Td/Ts, Td is derivative time
S3+6	Filter (C0)	Range: 0~1024
S3+7	Output lower limit	Recommended range: -2000~2000, when S3+1 bit3=0, please set 0; S3+1 bit3=1, please set -2000
S3+8	Output upper limit	Recommended values: 2000

Project

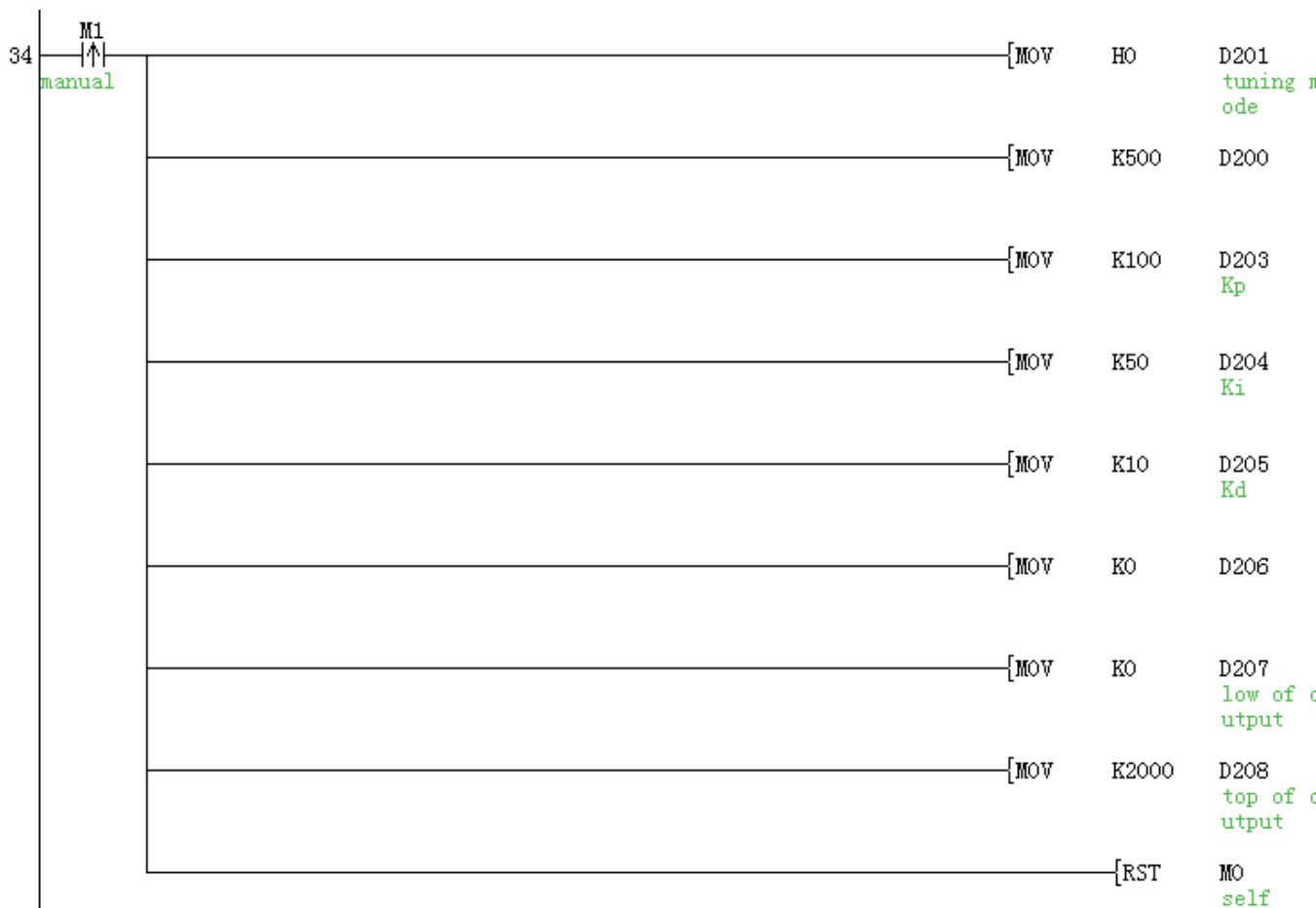
1. Set the target value when PLC is running.



2. Use M0 for trigger self-tuning mode, set the D201 (S3+1) is H10 (10000), and set other parameters.



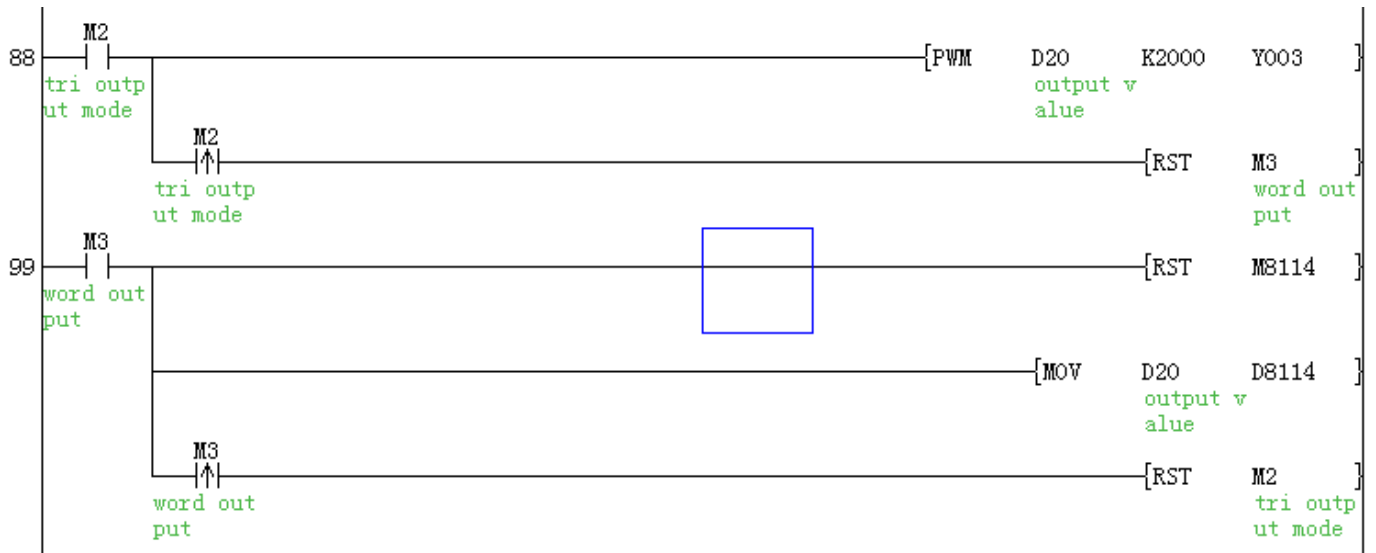
3. Use M1 for trigger manual-tuning mode, set the D201 (S3+1) is H00 (00000)



4. Trigger PID command by M0 or M1.



5. Use M2 for bit output, and use M3 for word output, in this project, it uses 2AD2DA-BD for analog output (4-20mA)



Version	Editor	date
V1.2	Anna Xu	2016-1-27