



PID tuning refers to a proportional-integral-derivative control algorithm used in hot ends and heated beds.

PID needs to have a P, I and D value defined to control the nozzle temperature. If the temperature ramps up quickly and slows as it approaches the target temperature, or if it swings by a few degrees either side of the target temperature, then the values are incorrect.

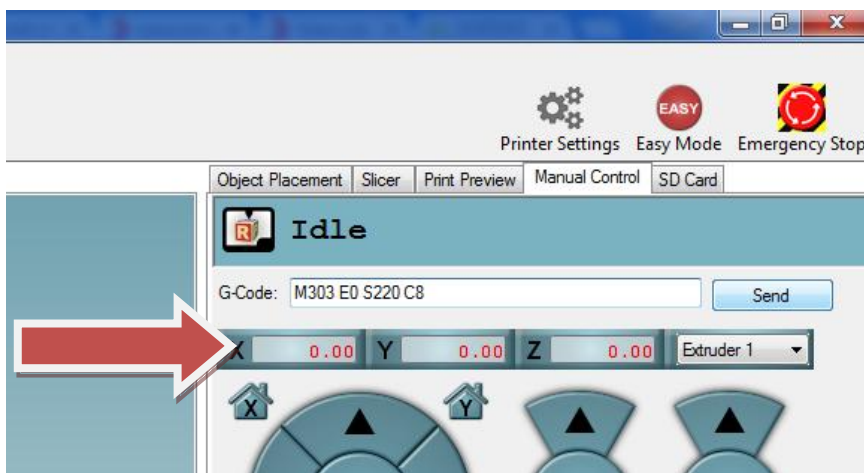
To run [PID Autotune](#) in Repetier and other firmware, run the following gcode with the nozzle cold:

```
M303 E0 S220 C8
```


This will heat the first nozzle (E0), and cycle around the target temperature 8 times (C8) at the given temperature (S220) and return values for P I and D. An example from [http://www.solikiwiki.com/PID\\_tuning](http://www.solikiwiki.com/PID_tuning) is:

```
bias: 92 d: 92 min: 196.56 max: 203.75
Ku: 32.59 Tu: 54.92
Classic PID
Kp: 19.56
Ki: 0.71
Kd: 134.26
PID Autotune finished ! Place the Kp, Ki and Kd constants in the
configuration.h
```

Turn on Printer and connect to PC or Mac via Repetier Software. Navigate to the 'Manual Control' tab





Enter M303 E0 S220 C8 in the G Code box and press the 'Send' button



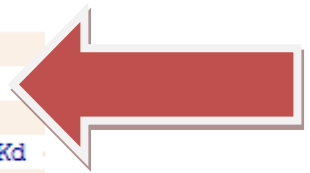

```
18:05:31.693 ok 75
18:05:31.696 T:20.73 /0 B:10.39 /0 B@:0 @:0
18:05:32.692 wait
18:05:32.869 N76 M303 E0 S220 C8 *127
18:05:32.873 ok 76
18:05:32.873 Info:PID Autotune start
18:05:33.885 T:20.73 /0 B:10.39 /0 B@:0 @:255
18:05:34.746 N77 M105 *55
18:05:34.890 T:21.10 /0 B:10.39 /0 B@:0 @:255
18:05:35.889 T:21.59 /0 B:10.39 /0 B@:0 @:255
18:05:36.889 T:22.44 /0 B:10.39 /0 B@:0 @:255
18:05:37.890 N78 M105 *55
```

Connected: Alpha

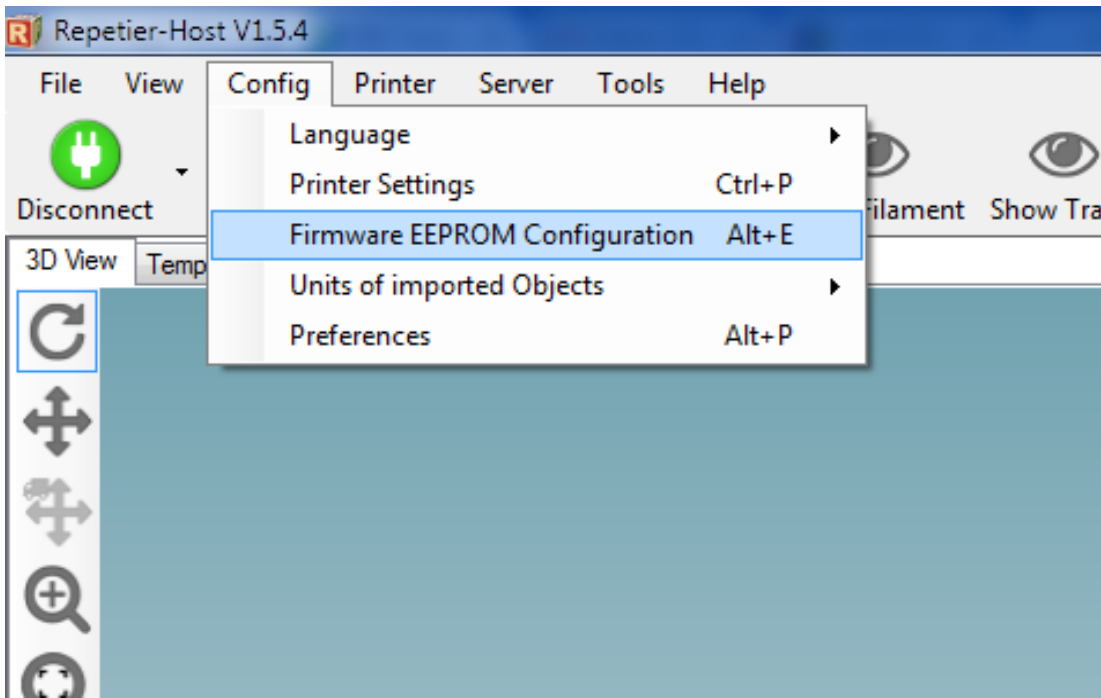


```
18:09:09.662 bias: 120 d: 120 min: 217.39 max: 228.33
18:09:09.662 Ku: 13.96 Tu: 23.33
18:09:09.662 Classic PID
18:09:09.666 Kp: 8.38
18:09:09.666 Ki: 0.72
18:09:09.666 Kd: 24.43
18:09:09.670 Info:PID Autotune finished ! Place the Kp, Ki and Kd
18:09:09.670 ok 77
18:09:09.672 T:219.86 /0 B:11.32 /0 B@:0 @:0
18:09:09.672 ok 78
18:09:09.679 T:219.86 /0 B:11.32 /0 B@:0 @:0
18:09:09.679 ok 79
```

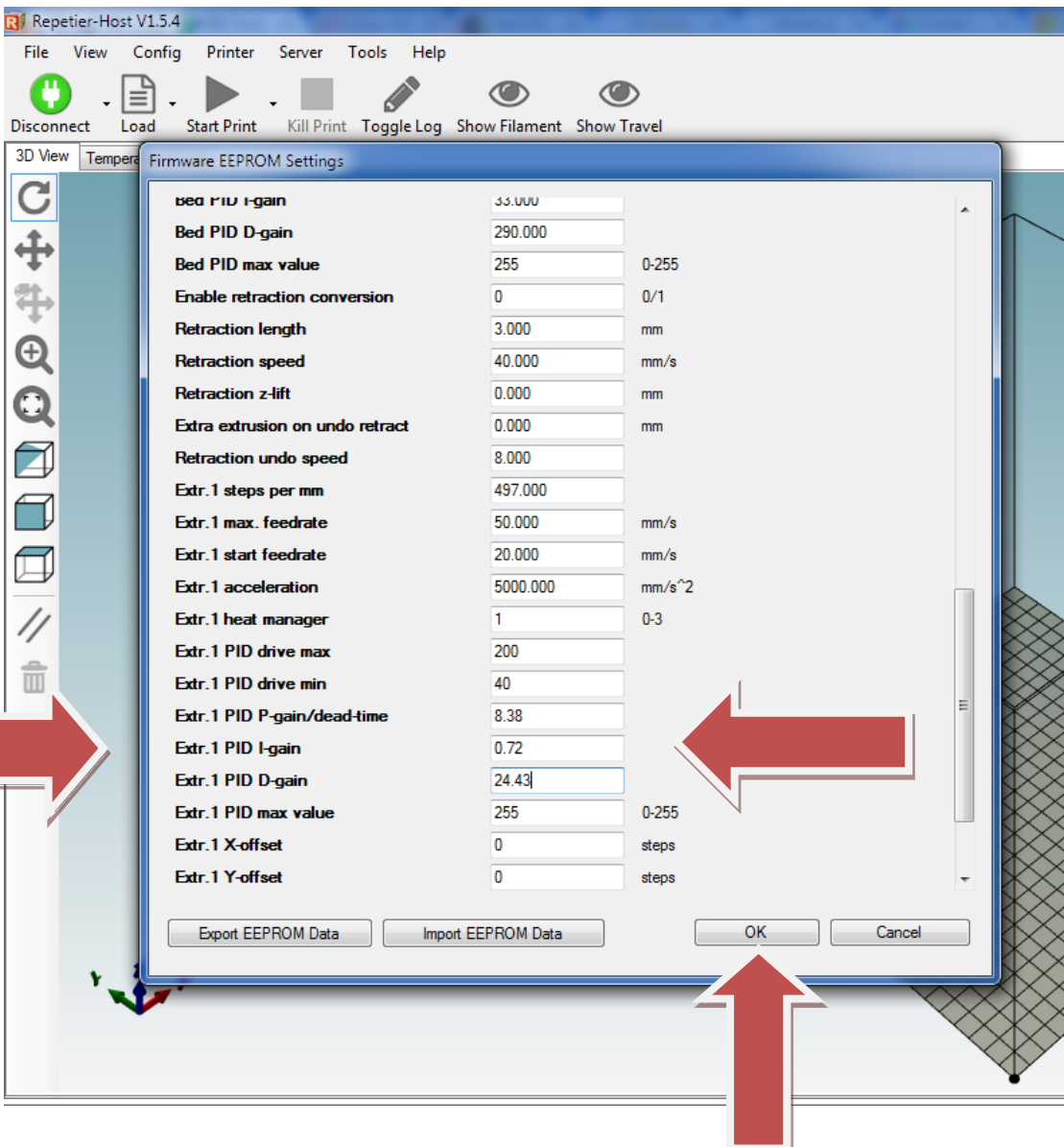
Connected: Alpha



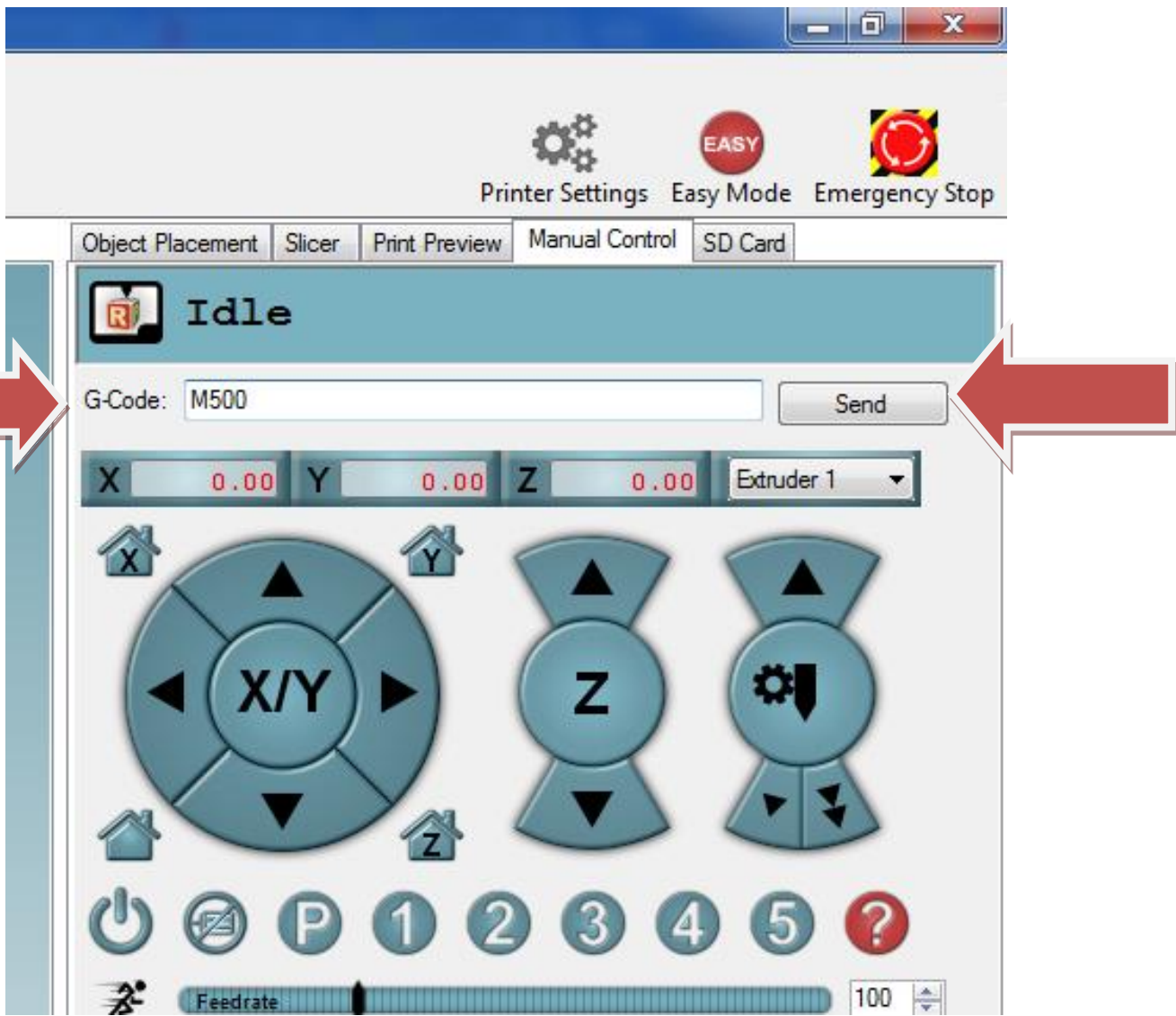
Take note of the (K)P, (K)I and (K)D numbers after the statement 'PID Autotune finished!' is seen in the log



Select the Alt+E above



Enter the P, I and D settings in the Extr. 1 Boxes above, then press the OK button



Enter M500 in the G Code line and press 'Send' button

PID Auto Tune is now Complete