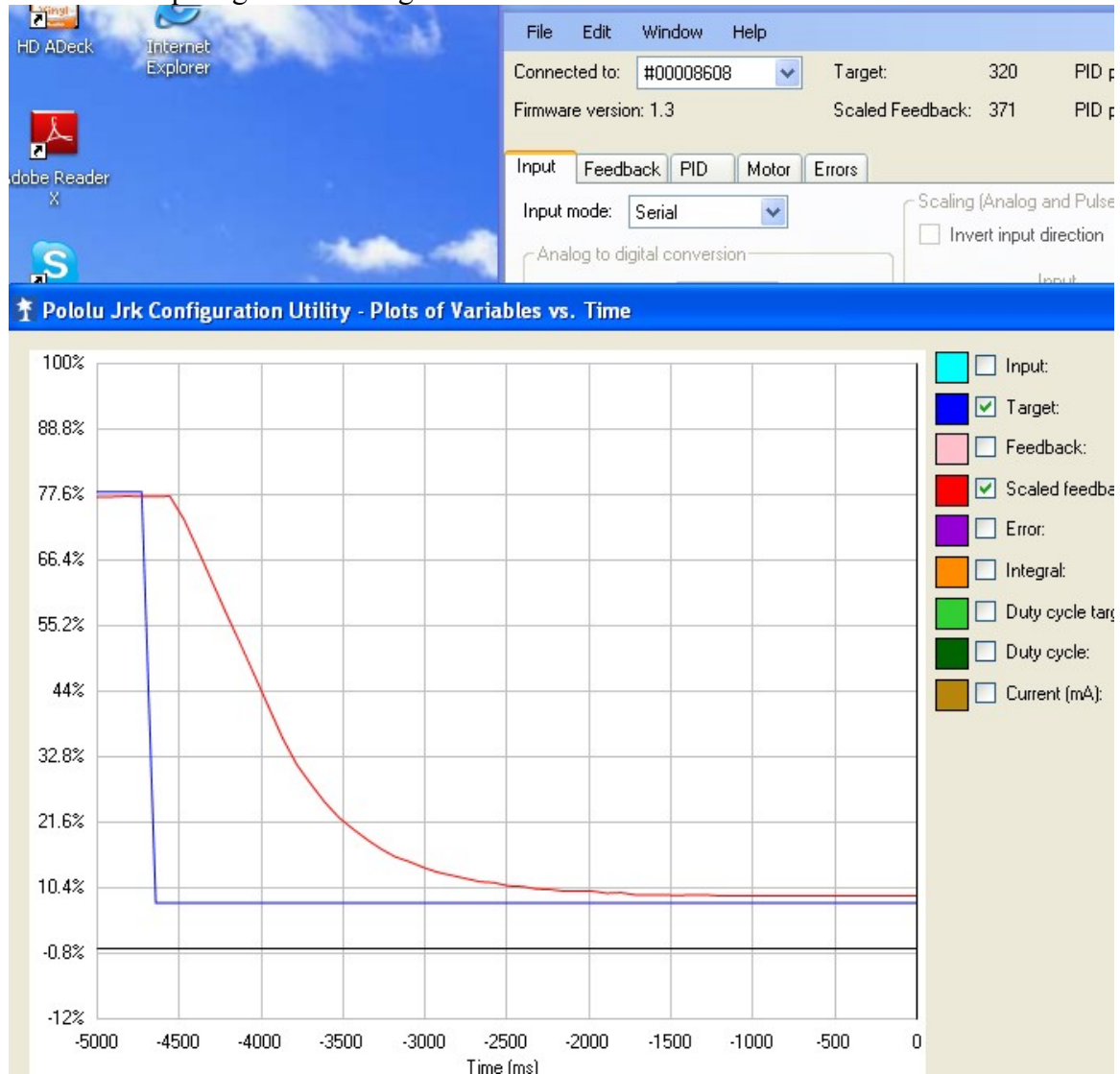


Below is JRK setup ($P=0.79980$) to move load with full power until within a few degrees of the target when it starts to slow down to approach the target value ever slowly. Note that it never quite gets to the target.



Input Feedback **PID** Motor Errors

Proportional Coefficient

$$\frac{819}{2 \cdot 10} = 0.79980$$

Integral Coefficient

$$\frac{121}{2 \cdot 12} = 0.02954$$

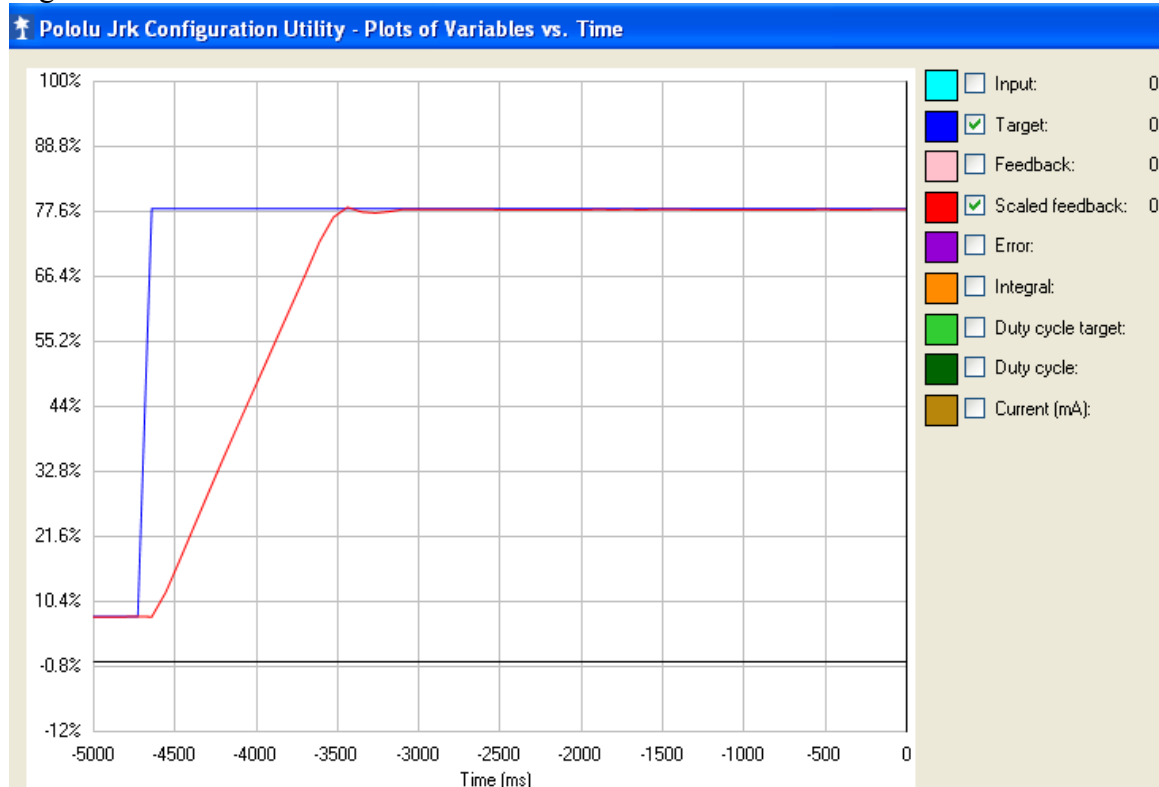
Derivative Coefficient

$$\frac{587}{2 \cdot 8} = 2.29297$$

PID period (ms): 86

Integral limit: 3

Below is JRK setup (P=2.19922) to move load with full power to the target. Note the accuracy is very good. Target value 320 & Scaled Feedback 319. There are 22 counts per degree.



File Edit Window Help

Connected to: #00008608 Target: 320 PID period count: 37780 ☐ Stop motor

Firmware version: 1.3 Scaled Feedback: 319 PID period exceeded: No Errors: 0x0000

Input Feedback **PID** Motor Errors

Proportional Coefficient

$$\frac{563}{2 \times 8} = 2.19922$$

Integral Coefficient

$$\frac{121}{2 \times 12} = 0.02954$$

Derivative Coefficient

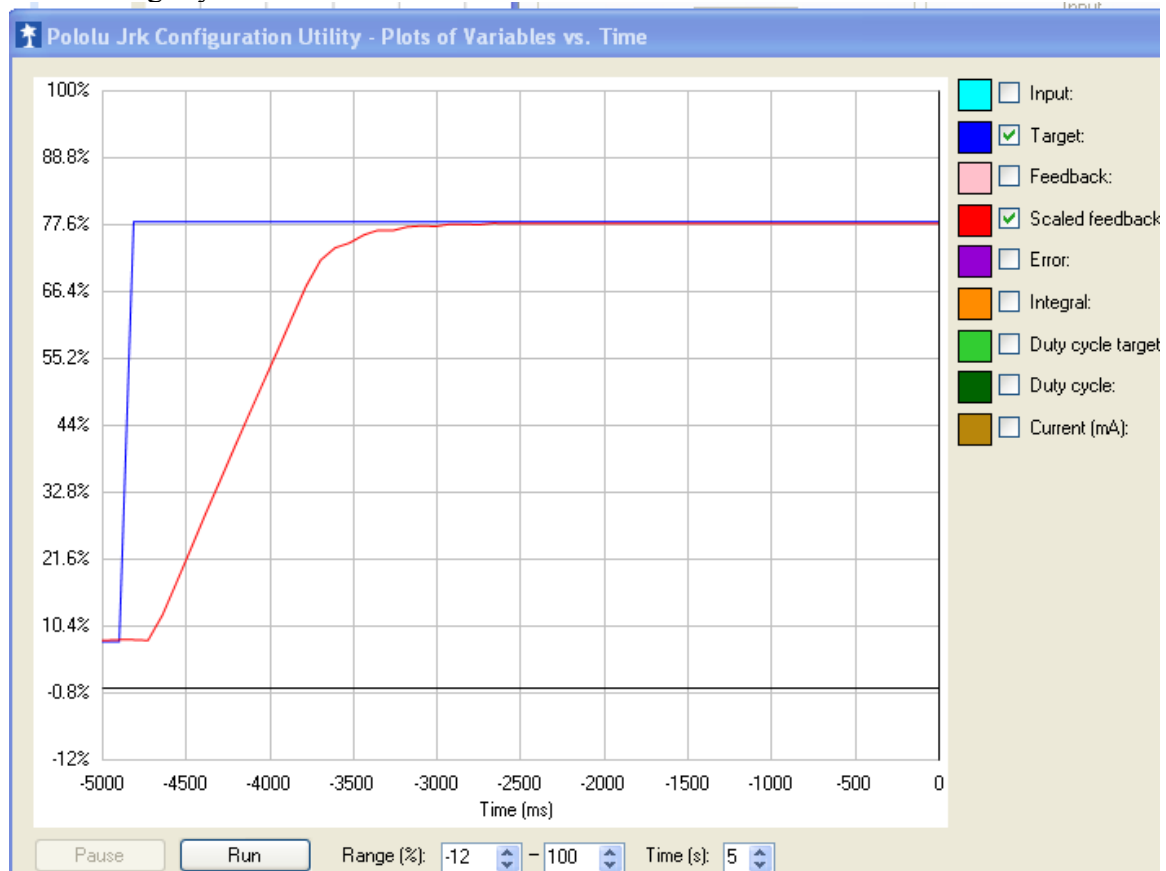
$$\frac{587}{2 \times 8} = 2.29297$$

PID period (ms): 86

Integral limit: 3

☐ Reset integral when proportional term exceeds max duty cycle

P value set to a compromise value of 1.80078. No overshoot of position but accuracy falls off slightly.



Connected to: #00008608 Target: 3200 PID period count: 50931 ☐ Stop motor
 Firmware version: 1.3 Scaled Feedback: 3187 PID period exceeded: No Errors: 0x0000

Input Feedback **PID** Motor Errors

Proportional Coefficient

$$\frac{461}{2 \times 8} = 1.80078$$

Integral Coefficient

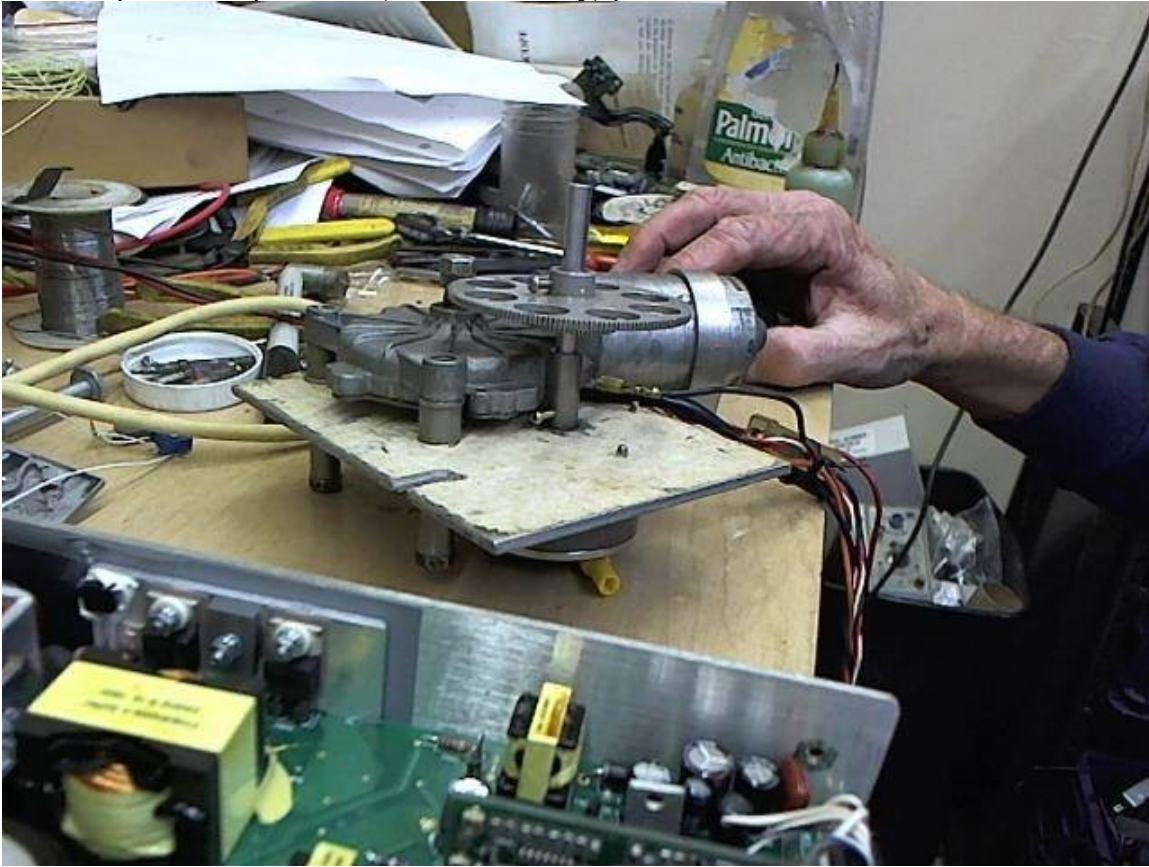
$$\frac{121}{2 \times 12} = 0.02954$$

Derivative Coefficient

$$\frac{587}{2 \times 8} = 2.29297$$

PID period (ms): 86
 Integral limit: 3
☐ Reset integral when proportional term exceeds max duty cycle

Test setup with 5K precision (0.25 % linearity) pot.



I was wrong about the pots. AB carbon pots do not cut it if you need precision wirewound. Value should be above 1500 ohms to minimize loading of the AUX output. Accuracy is slightly improved if the motor power input (12.5 VDC) is regulated.

Conclusion: If you want high accuracy the load relative to power input needs to be as linear as possible. You need to minimize the slop in the drive train. Adverse over shoot effects due to non linearity of load can be minimized by having the gear ratio high enough to move the load only slightly faster than that required to track the target. You need lots of reserve torque.