

# Key Terms with Tuning

## Error

- The difference between 2 lines (i.e. Position & Reference or Velocity & ReferenceSlope)

## Gain

- Tuned values such as  $k_P$ ,  $k_S$ , or  $k_V$

## $k_P$

- The larger the difference between the current and target positions, the more power it puts to the motor to reduce the error
- Typically will cause some oscillation

## $k_I$

- If there is a consistent error between 2 lines, this gain will gradually reduce the difference between them

## $k_D$

- Resists change in movement of the motor
- This gain helps to dampen the effects of  $k_P$ , reducing egregious amounts of oscillation

## $k_S$

- The 'S' stands for Static Friction
- The amount of extra force needed when the motor starts up to combat the Static Friction

## $k_V$

## **kA**

- This gain increases the acceleration of the motor
- This makes something like the *Position* line steeper the more it's increased

## **kG**

- This is the amount of extra force the motor needs to combat the force of gravity
- This is especially important in an elevator to make sure it keeps its vertical position

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Revision #1

Created 9 July 2026 23:28:11 by Amit Choudhary

Updated 9 July 2026 23:41:08 by Amit Choudhary