

**EE 462**

**Project-0**

***DC motor simulation***

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## 1. Motor

Parameters of the selected motor are given below

Armature resistance and inductance [ $R_a$  (ohms)  $L_a$  (H) ]

[ 0.5 0.01]

Field resistance and inductance [ $R_f$  (ohms)  $L_f$  (H) ]

[ 240 120]

Field-armature mutual inductance  $L_{af}$  (H) :

1.23

Total inertia  $J$  ( $\text{kg.m}^2$ )

0.05

Viscous friction coefficient  $B_m$  (N.m.s)

0.02

Coulomb friction torque  $T_f$  (N.m)

0

Initial speed (rad/s) :

0.1

**Figure 1.** Parameters of the selected motor

## 2. Power source and control system

There are two power sources in this configuration.

DC Voltage Source (mask) (link)

Ideal DC voltage source.

Parameters

Amplitude (V):

280

**Figure 2.** DC source for armature of the motor

DC Voltage Source (mask) (link)

Ideal DC voltage source.

Parameters

Amplitude (V):

240

**Figure 3.** DC source for field winding of the motor

There is a PID control to adjust the speed of the motor.

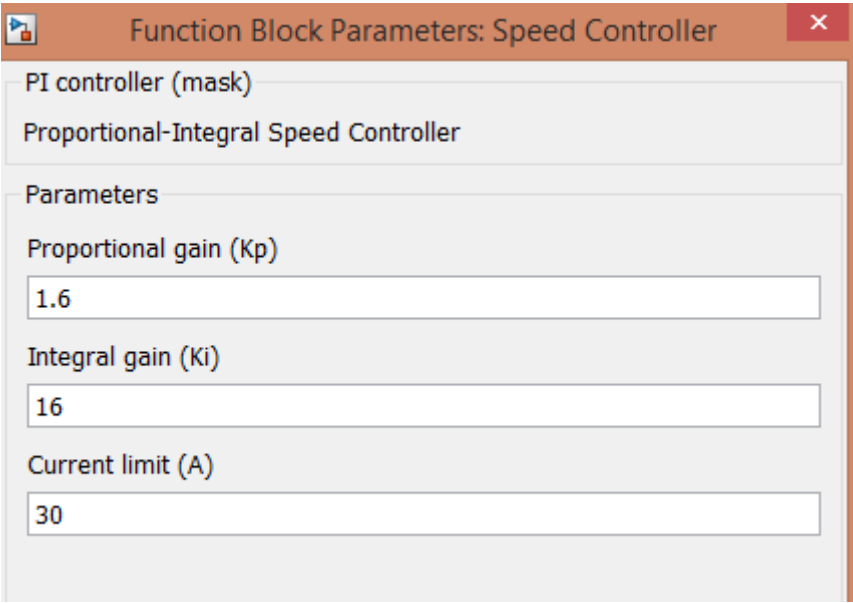


Figure 4. Parameters of the controller

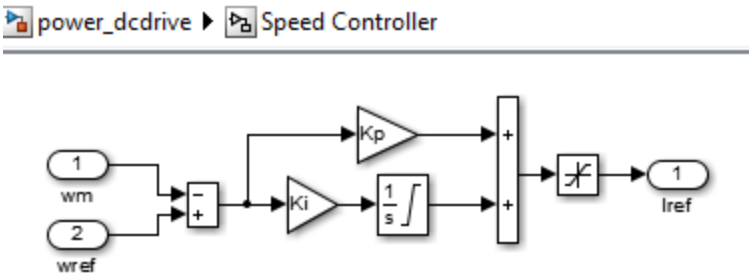


Figure 5. Configuration of the speed controller

### 3. Simulink model

#### Chopper-Fed DC Motor Drive (Continuous)

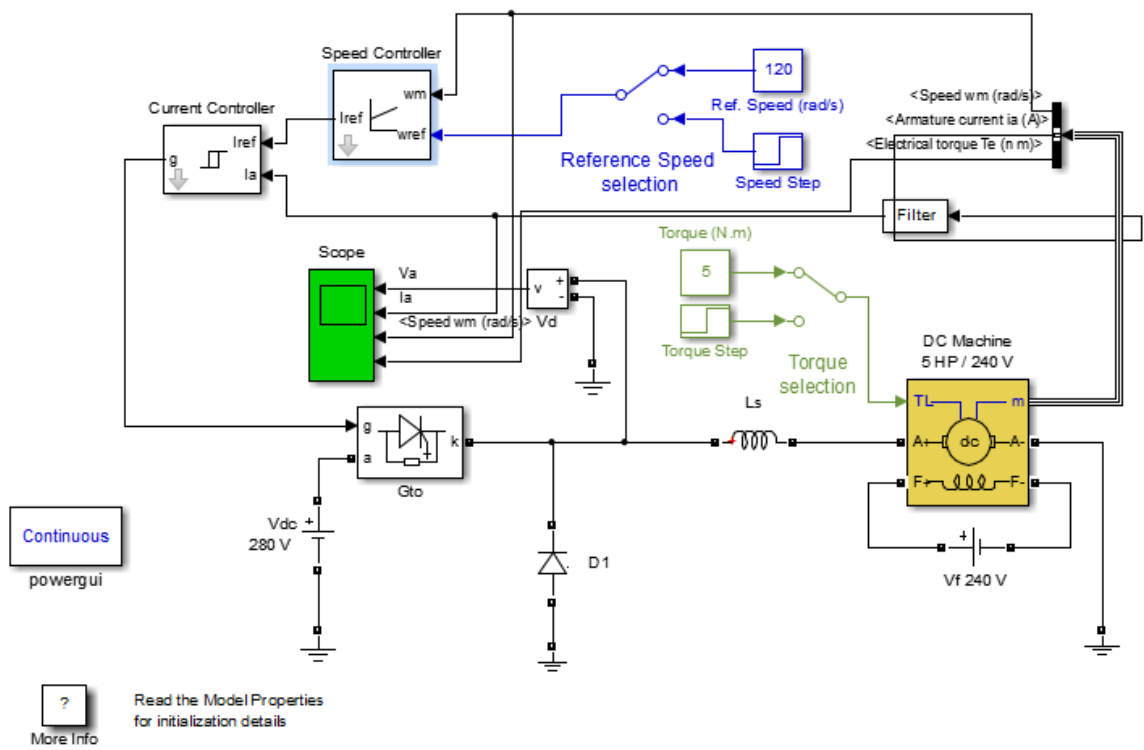
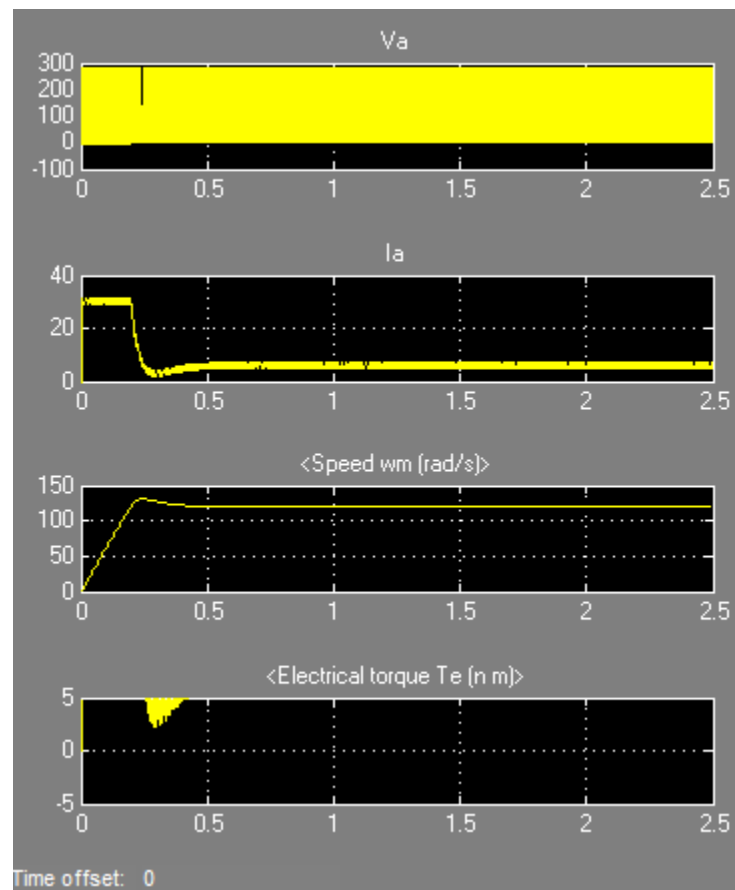


Figure 6. DC Motor Drive [1]

#### 4. Graphs



**Figure 7.** Armature voltage and current, speed and electrical torque of the motor

#### 5. Bibliography

- [1] <https://www.mathworks.com/help/physmod/sps/examples/chopper-fed-dc-motor-drive-continuous.html>