

ME 360: FUNDAMENTALS OF SIGNAL PROCESSING, INSTRUMENTATION, AND CONTROL

Experiment No. 4 Modeling and Identification of an Electric Motor using Step Response Methods Data Sheet

6.2 STEADY-STATE GAIN (20 PTS)

V_{DAC} [V]	V_{DMM} [V]	$K = V_{DMM} / V_{DAC}$ [V/V]
3		
4		
5		
6		

Observations:

6.3 STEP RESPONSE (30 PTS)

Method	Data	
	$V_{in}(t \geq 0)$	4 V
	$V_{out}(\infty)$	
	$K = V_{out}(\infty) / V_{in}(t \geq 0)$	
Time at 63.2 % of Maximum Change	$\tau_{63.2}$	
Steady-state Asymptote and Tangent at $t = 0$	τ_{tan}	
Integral of Response Curve	K_{int}	
	τ_{int}	
Iterative Fit of Observed Response Data	K_{fit}	
	τ_{fit}	

Observations:

Which method do you think is the most accurate calculation of the time constant? Why? (10 pts)

How sensitive is τ_{int} to changes in the steady state voltage level? How accurate is this voltage level? (10 pts)