

Lab 2: Controllers Specifications and Marking Guideline

Controller Demonstration Marking Guidelines (Total Marks 20)						
Marks	0	1	2	3	4	MARK
Set Point Tracking	No Tracking or Large Error	Within 1m of Final Value	Within 0.8m of Final Value	Within 0.6m of Final Value	Within 0.4m of Final Value	
Over/undershoot	Unlimited/ Very Large	Within 30%	Within 25%	Within 20%		
Settling Time. No oscillations	$> t_{2\%} + 7s$	$> t_{2\%} + 4s$ $< t_{2\%} + 7s$	$> t_{2\%} + 2s$ $< t_{2\%} + 4s$	$> t_{2\%}$ $< t_{2\%} + 2s$	Within $t_{2\%}$ $t_{2\%} =$	
Output Disturbance rejection. Return to the previous final value	$> t_{2\%} + 7s$	$> t_{2\%} + 4s$ $< t_{2\%} + 7s$	$> t_{2\%} + 2s$ $< t_{2\%} + 4s$	$> t_{2\%}$ $< t_{2\%} + 2s$	Within $t_{2\%}$	
Simulated Plot for an input Step of 5.	No Plot		Plot shown			
Circuit diagram of your controller	No circuit diagram	Partial circuit diagram	Circuit diagram not fully labelled	Fully labelled circuit diagram		
Penalty Marks	Controller Output: High amplitude oscillations of $> 0.4v$ 2 Mark penalty	On/Off Bang-Bang Controller Type 8 Mark penalty	Using more than 4-Op Amps 3 Mark penalty	Other:		
TOTAL MARKS						

Figure 1 Controller requirements with the marking guidelines

- Figure 1 shows your controller requirements with allocated marks and penalties
- Your expected settling time $t_{2\%}$ can be seen by clicking options on the Helicopter software in the lab.
- Please provide a simulated response of a 0-5m input step. (Electronic or paper)
- Your overshoot will be tested with a setpoint height of 5m.
- NB Your sensor is already compensated for in the plant. This can be seen by experimentation.
- Provide a fully label circuit diagram (electronically or paper).