Servo Control Unit Documentation

Description of module

This module is a System Verilog document which is used to communicate with the ATU and PWMC in real time. It is capable of controlling the motor using proportional or bang-bang control.

Requirements

1. It must be possible to set the motor angle with an accuracy of 1 degree using proportional control
2. It must be possible to set the motor angle with an accuracy of 1 degree using bang bang control
3. The device must contain an internal input register used to set desired angle, PWM period, type of control and power status
4. The device must output a status register containing the current angle to be passed to the DC
5. It must be possible to input commands:
    a. Continuous mode
    b. Reset the current angle to zero degrees
    c. No command – defaults as brake
    d. Brake – override everything including PWM power
6. It must output the direction required to reach desired angle in the shortest time

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How Requirements were met

1. This can be seen under the comment title “PROPORTIONAL CONTROL”
2. This can be seen under the comment title “BANG BANG CONTROL”
3. This can be seen under the comment title “INPUT REGISTER”
4. This can be seen under the comment title “STATUS REGISTER”
5. This can be seen under the comment title “COMMANDS”
6. This can be seen under the comment title “DIRECTION SELECTOR”

Inputs

- inputR = “input register” input from IC
- atuAngle = binary encoded angle from ATU

Outputs

- Direction = direction the motor should turn to reach desired angle fastest
- pwmDT = duty cycle for the PWMC
- pwmPeriod = period for the PWMC
- status = “status register” for the DC

Additional Information

None