Display Controller Documentation

Description of module

This module is a System Verilog document which is used to write the current motor angle to the LCD.

Requirements

1. Angles must be read at a fixed rate [60Hz]
2. Binary encoded angles must be converted to degrees rounded to the nearest degree
3. Rounded degrees must be converted to binary coded decimal
4. Binary coded decimal must be converted into 3 ascii characters
5. DC must clear LCD screen each time the displayed angle is updated
6. DC must output the 3 ascii characters to the LCD

How Requirements were met

1. This can be seen under the comment title “FIXED RATE SCREEN REFRESH”
2. This can be seen under the comment title “CONVERT ANGLES TO DEGREES”
3. This can be seen under the comment title “CONVERT DEGREES TO BCD”
4. This can be seen under the comment title “CONVERT BCD TO ASCII”
5. This can be seen under the comment title “DISLAY ASCII ON LCD”
6. This can be seen under the comment title “DISLAY ASCII ON LCD”

Inputs

- clk = input from 50MHz clock
- busyF = value of LCD pin D7 used to read the busy flag
- angle = 12 bit binary encoded angle from SCU status register

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Outputs

- data = 8 bit register used to output data to LCD data pins
- rs = used to output data to LCD register select in
- rw = used to output data to LCD read/write pin
- e = used to output data to LCD enable pin

Additional Information

Angles were chosen to be read at 60Hz as the frame frequency according to the LCD datasheet is 64Hz