

# **REPORT**

## **Components used:**

1. 1 Hz clock generator: The frequency of 100 MHz clock is converted to 1 Hz .
2. 1 KHz clock generator: The frequency of 100 MHz clock is converted to 1 Hz .
3. 2 MHz clock generator: The frequency of 100 MHz clock is converted to 1 Hz .
4. PWM Module: Pulse width modulation. Used and explained in Assignment 6.
5. Communication module: In communication module there are 4 inputs given, two of which are clock of frequency 1 Hz and 2 MHz and other two are Chip Select(CS) and SCLK. Output is four MSBs out of the 8 bits which is produced by the PMOD. In this CS will be 0 at the rising edge of the clock of frequency 1 Hz . When CS becomes 0 , then the value of SDO will be produced as bits by the PMOD at the rising edges of the clock SCLK which is basically equal to the clock of frequency 2 MHz at the time when CS=0. This cycle will repeat itself and hence value of bits produced by PMODALS will be counted every second.
6. PMODALS: Peripheral Module Ambient Light Sensor will sense the outside light and will give the analysis to the LEDs which will change its brightness accordingly. PMODALS will give the ambient light in the form of 15 bits, leading 3 of which are 0 and trailing four are 0 as well and the middle 8 bits will change with the change in the ambient light.
7. 7 Segment display: The brightness of LEDs will change according to the ambient light and the value of brightness will be displayed on the seven segments.

## **#COMMUNICATION MODULE**

### **\*\*Chip select:**

The value of it changes only at the rising edge of the 1 Hz clock and it changes to 0 at this point. The value of SBO will be read only when value of CS is 0.

### **\*\*SCLK:**

The value of SCLK will be 1 when the value of CS is 1 else its value will vary the same way the value of CLK2 varies which is the clock of 2 MHz frequency.

### **\*\*SBO:**

Its value will change according to the ambient light .

## **\*\*4 MSBs:**

The PMOD will produce 15 bits leading 3 of which are 0 and trailing four are 0 as well and the middle 8 bits will change with the change in the ambient light. Out of those 8 bits the 4 MSBs are taken as input to the PWM because the PWM used here is the PWM of assignment 6 which works on 4 digit bit as input.

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## **TEST CASES**

