DDS PROJECT ABSTRACT

SOCCER SCORE BOARD

To design and implement a circuit to manage the scoreboard in a soccer game.

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Abstract

Digital electronics, or digital (electronic) circuits, represent signals by discrete bands of analog levels, rather than by a continuous range. Digital techniques are useful because it is easier to get an electronic device to switch into one of a number of known states than to accurately reproduce a continuous range of values.

Digital electronic circuits are usually made from large assemblies of logic gates, simple electronic representations of Boolean logic functions. An advantage of digital circuits when compared to analog circuits is that signals represented digitally can be transmitted without degradation due to noise.

This project aims at designing a soccer scorecard using simple digital electronic components, using Multisim.

Multisim is an electronic schematic capture and simulation program which is part of a suite of circuit design programs, along with NI Ultiboard. It is used for software simulation.

WORKING PRINCIPLE

A Soccer game consists of two halves. Each half is 45 minutes long. It is played between two teams.

A timer circuit is used to keep track of the half timings using clock cycles set at appropriate frequency,(say 0.5Hz).

The scores of both the teams during each half of the game is calculated using the decade counter and scores are displayed using the seven segment displays.

After the completion of the two halves of the soccer game, the total score is calculated and the final score is displayed.

A comparator is used to compare the final scores obtained by the two teams.

The winner of the game (say team A or B) is displayed using different seven segment displays.

COMPONENTS REQUIRED:

1. 7 Segment display

It is a form of electronic display device for displaying decimal numerals that is an alternative to the more complex dot matrix displays.

2. Decade Counter

A decade counter is one that counts in decimal digits, rather than binary. A decade counter may have each (that is, it may count in binary-coded decimal, as the 7490 integrated circuit did) or other binary encodings. "A decade counter is a binary counter that is designed to count to 1010b (decimal 10).

3. Decoder

A decoder is a device which does the reverse operation of an encoder. The same method used to encode is usually just reversed in order to decode. It is a combinational circuit that converts binary information from n input lines to a maximum of 2n unique output lines.

4. Comparator

A digital comparator or magnitude comparator is a hardware electronic device that takes two numbers as input in binary form and determines whether one number is greater than, less than or equal to the other number.

5. T Flip Flop

Each flip-flop stores a single bit of data, which is emitted through the *Q* output on the east side. Normally, the value can be controlled via the inputs to the west side. In particular, the value changes when the clock input, marked by a triangle on each flip-flop, rises from 0 to 1 (or otherwise as configured); on this rising edge, the value changes according to the table below.

T	*Q+*
0	*Q*
1	*Q*

T	*Q+*
0	*Q*
1	*Q*

When the clock triggers, the value remembered by the flip-flop either toggles or remains the same depending on whether the *T* input (*Toggle*) is 1 or 0. Used in the circuit of the decade counter along with other gates.

6. Hex Digit Display

Using a seven-segment display shows the hexadecimal digit corresponding to the four-bit input. If any of the inputs are not 0/1 (either floating or error), then the display shows a dash ('-'). A separate one-bit input controls the display of the decimal point.

7. Basic Gates

AND, OR, and NOT gates are the basic building blocks of any electronic circuits. They are called the basic logic gates.

8. Universal Gates

NOR gates alone or alternatively NAND gates alone can be used to reproduce the functions of all the other logic gates.

9. Buttons

Outputs 0 normally; but when the user is pressing the button using the Poke Tool, the output is 1.

10. Pins

A pin is an output or an input to a circuit, depending on the value of its Output attribute. In drawing a pin, Multisim represents output pins using a circle or rounded rectangle, and input pins are represented using squares or rectangles.

11. Clock

The clock toggles its output value on a regular schedule as long as ticks are enabled via the Simulate menu.

12. Splitter

The splitter creates a correspondence between a multi-bit value and several separate subsets of those bits. Despite its name, it can either split a multi-bit value into component parts, or it can combine component parts into a multi-bit value - or indeed it can do both at once.