Digital System Stop Watch

What is stopwatch?

- A digital stop watch is time-keeping device that is designed to measure the time elapsed from the start time to end time of an event
- It counts in increments every 0.01s.

Circuit Design

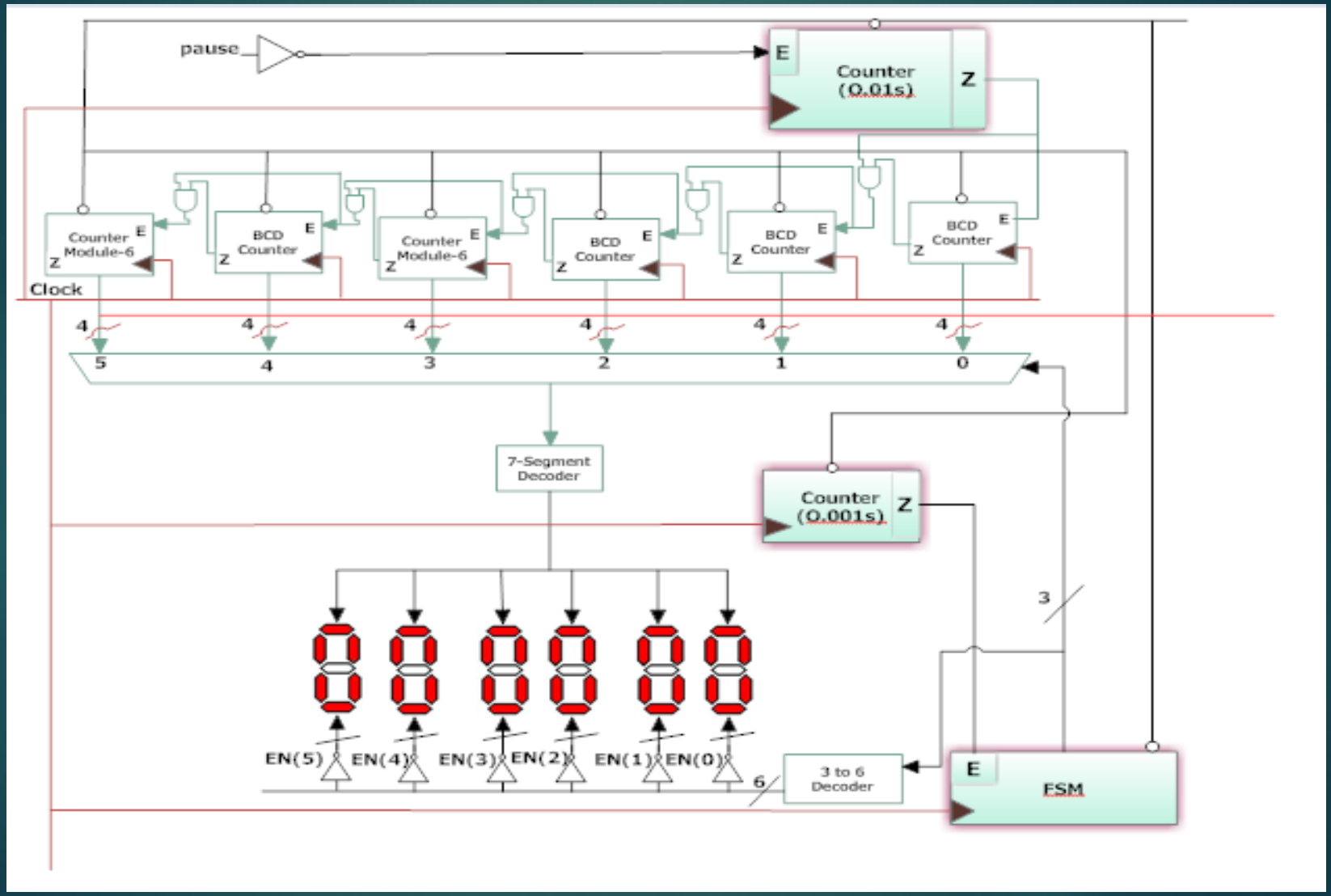
- We have five inputs:

1. Pause: start and stop the watch.
2. Reset: resets all digits to zeros.
3. Write to LCD: writes elapsed time to LCD
4. HTSeconds: Used to activate or deactivate the Hundredth seconds.
5. Clock, which is 100MHz in our board.

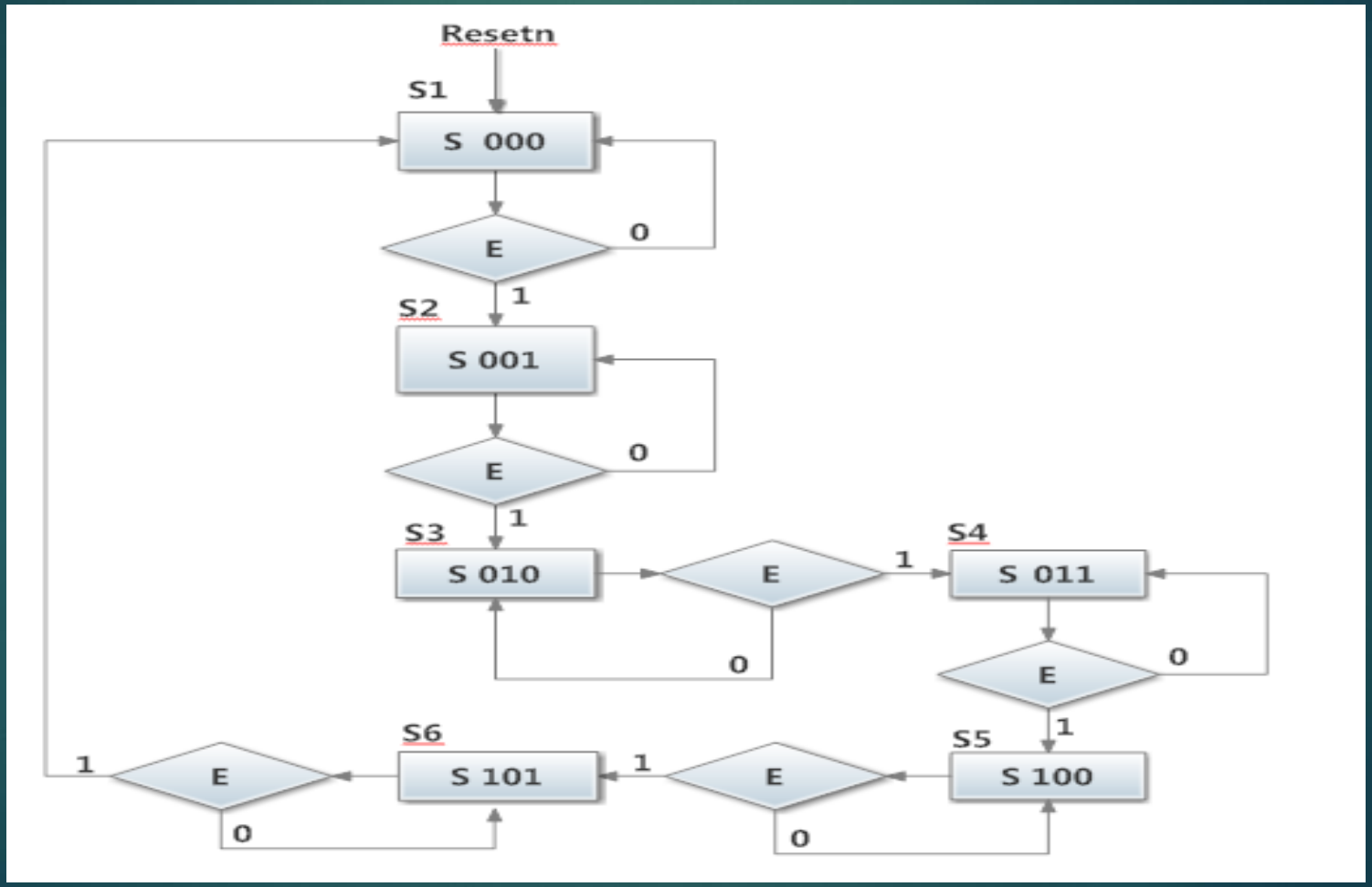
Circuit Design

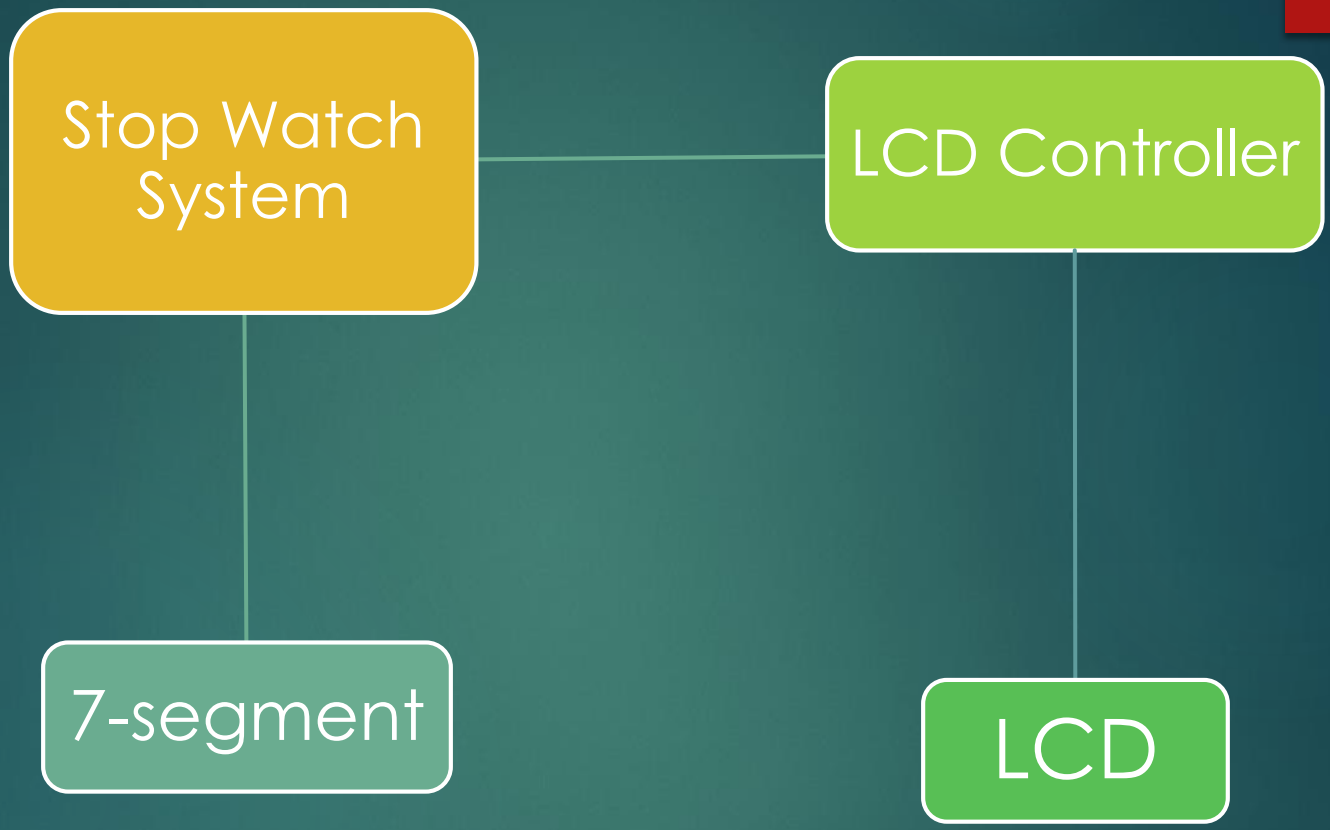
- Outputs:
1. Count on 6 7-segment displays.
2. LCD screen: stop watch & elapsed time.
- Target board: DIGILENT NEXYS-4 Board.
- Target LCD: HD44870.

Data Path Design



Algorithmic State Machine




Stop Watch System
LCD Controller
7-segment
LCD

LCD

- Use LCD as the second screen

1. BCD to ASCII decoder
2. State machine as the LCD controller

References

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http://www.digilentinc.com/data/textbooks/intro_digital_design-digilent-vhdl_online.pdf

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Any Questions?

Thank you