

RGB LED Color Control

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Introduction

In this project, we designed and implemented a digital system whose outputs manipulate the color of the RGB LED based on inputs from various sensors:

- Switches

- Accelerometer

- Temperature sensor

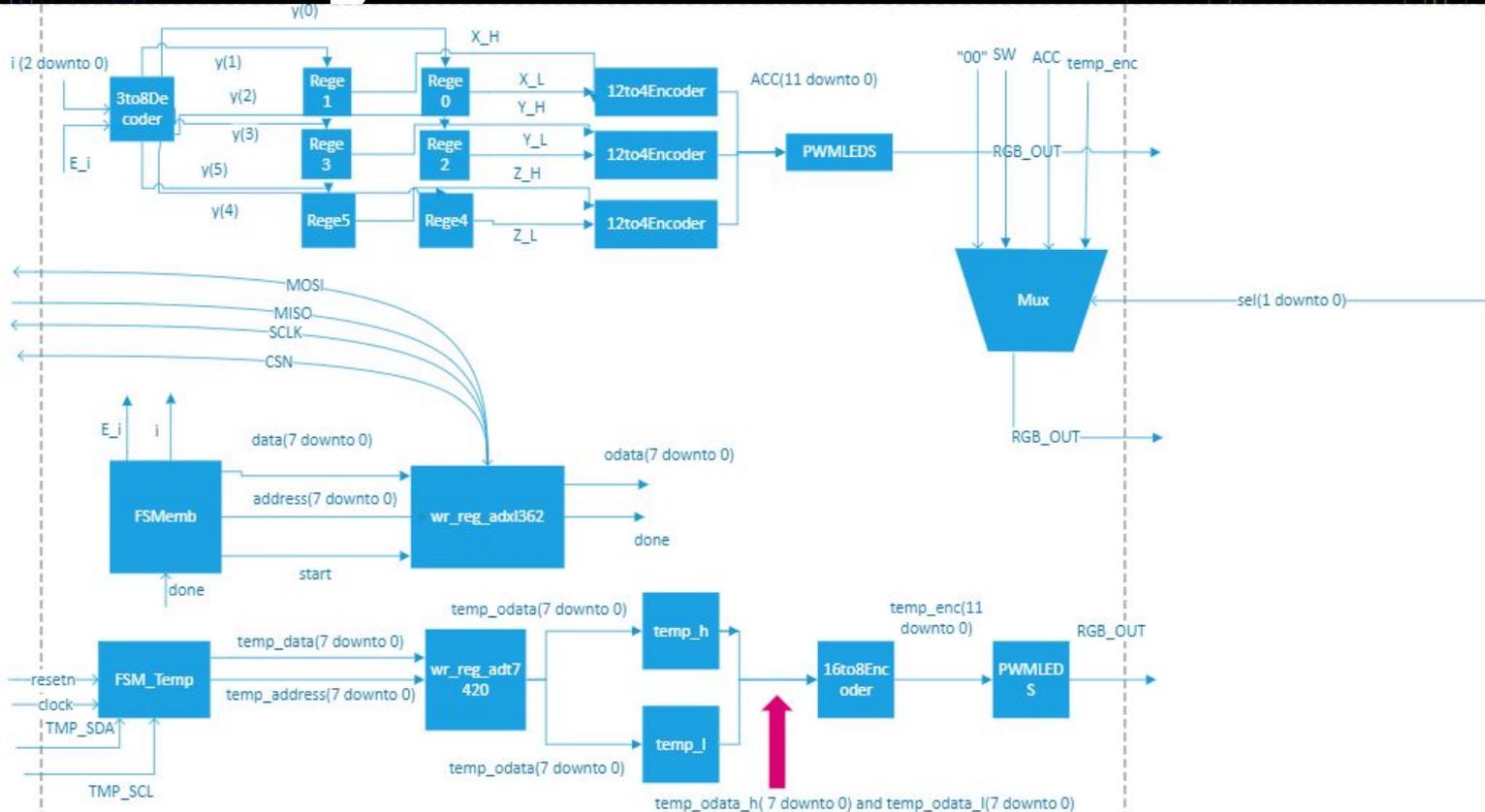
These components work individually with the use of a selector that can decide between these three modes and an off state

Consists of FSMs (Finite State Machine), two encoders (12 to 4) & (16 to 8), decoder (3 to 8), accelerometer and temperature sensor drivers, PWM controllers, registers

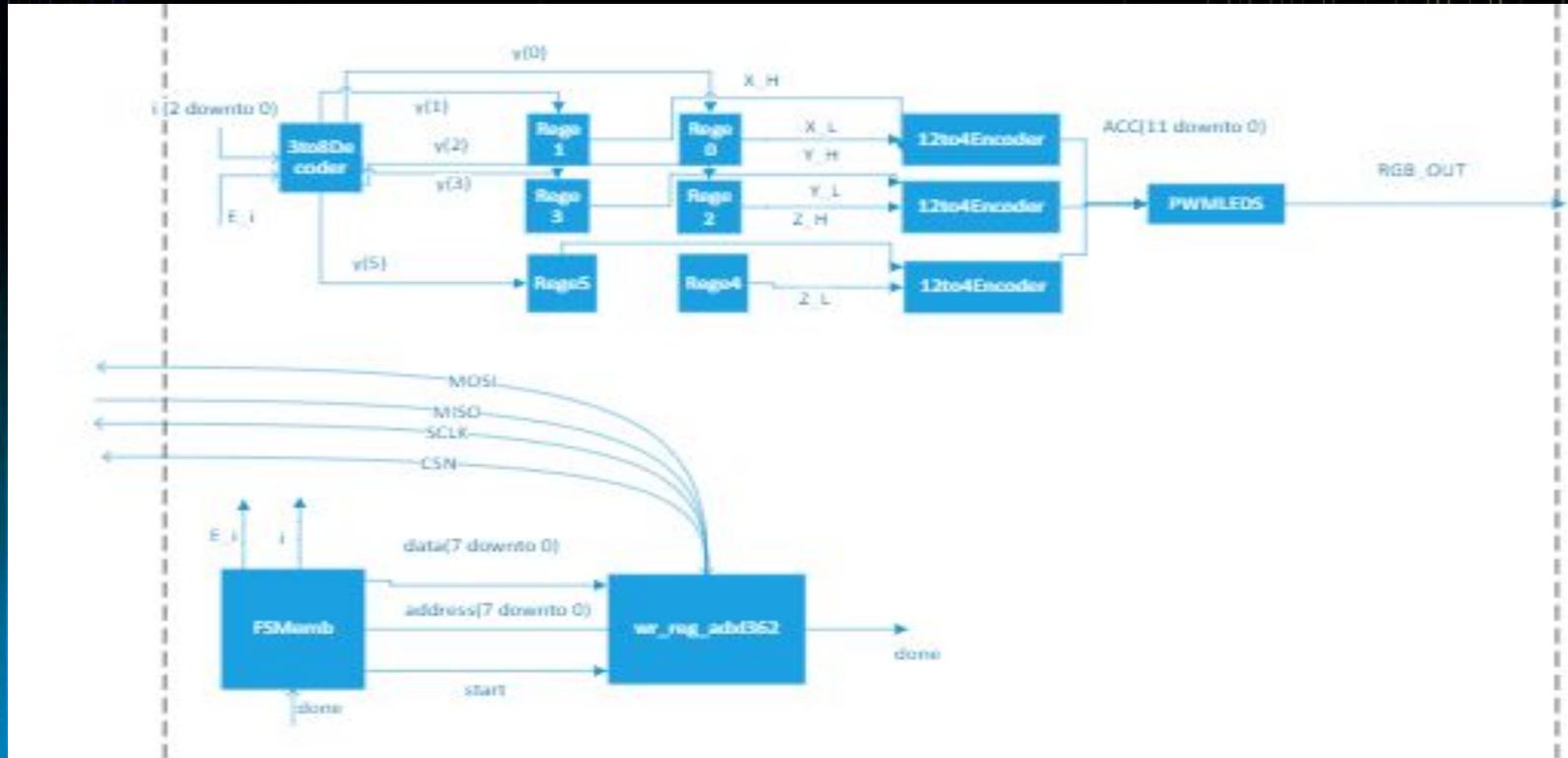
In accelerometer mode, each color of RGB is controlled by one of the axes so changing the orientation of the board will change the color combination displayed

In temperature sensor mode the LED will display solid blue at room temperature, then as the temperature rises it will move through combinations of red and blue until it is solid red.

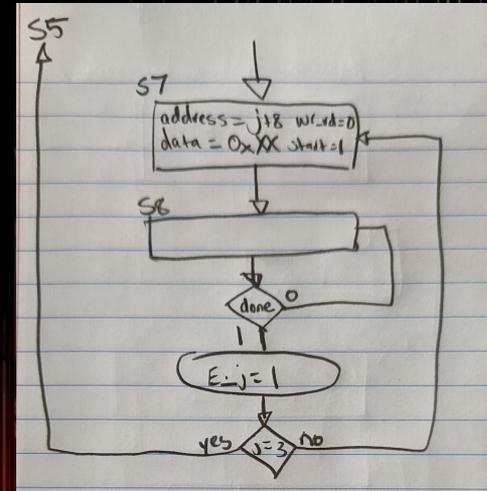
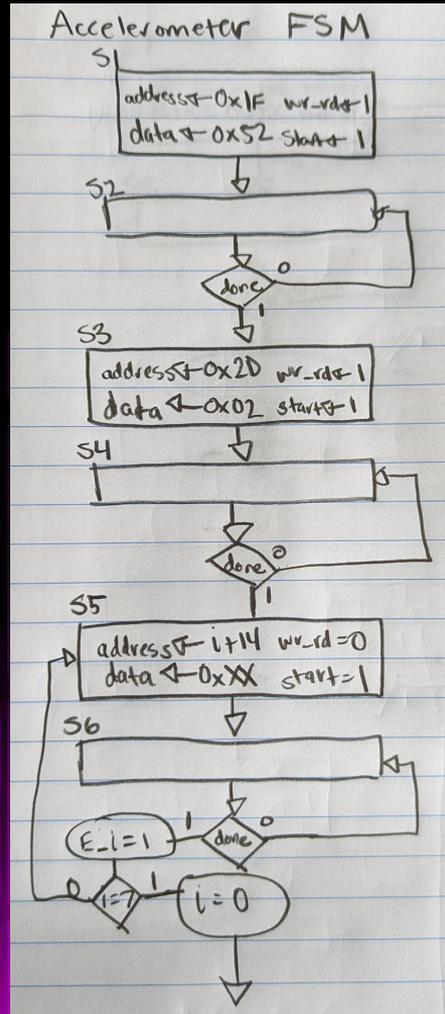
Block Diagram



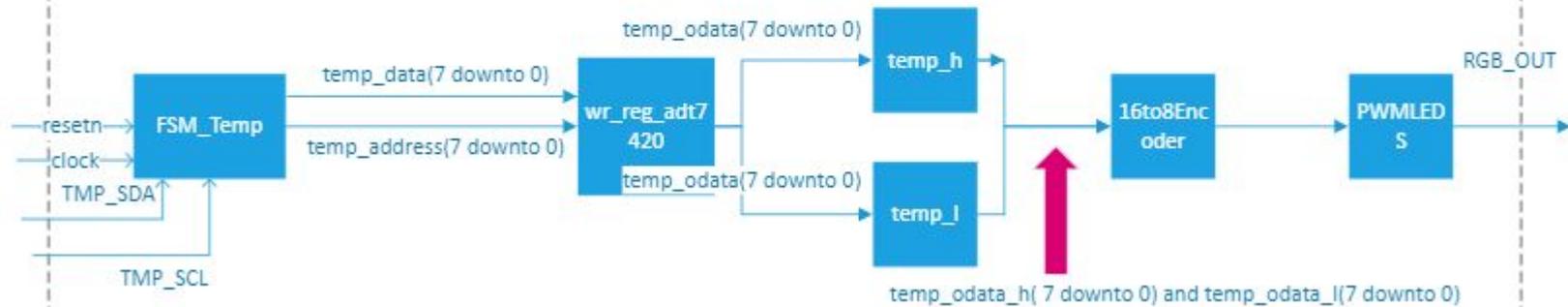
Accelerometer Circuit



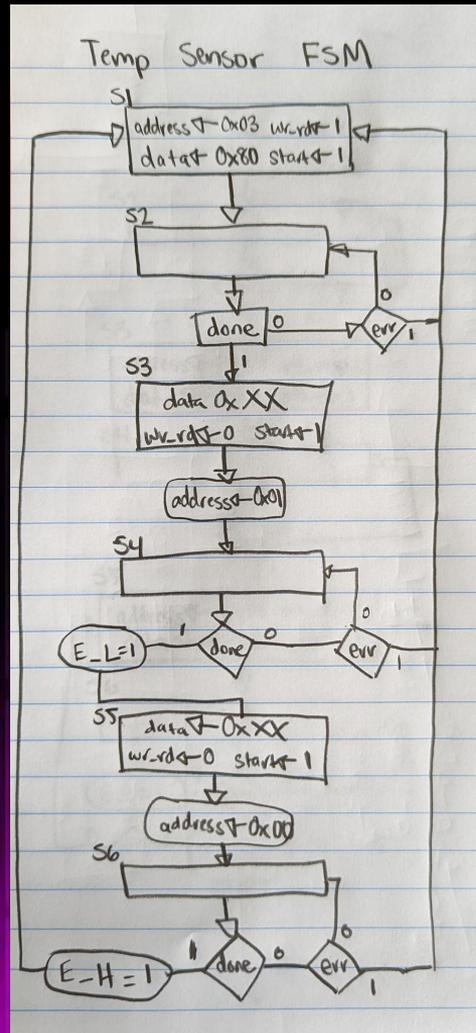
FSM Diagram



Temp Sensor Circuit



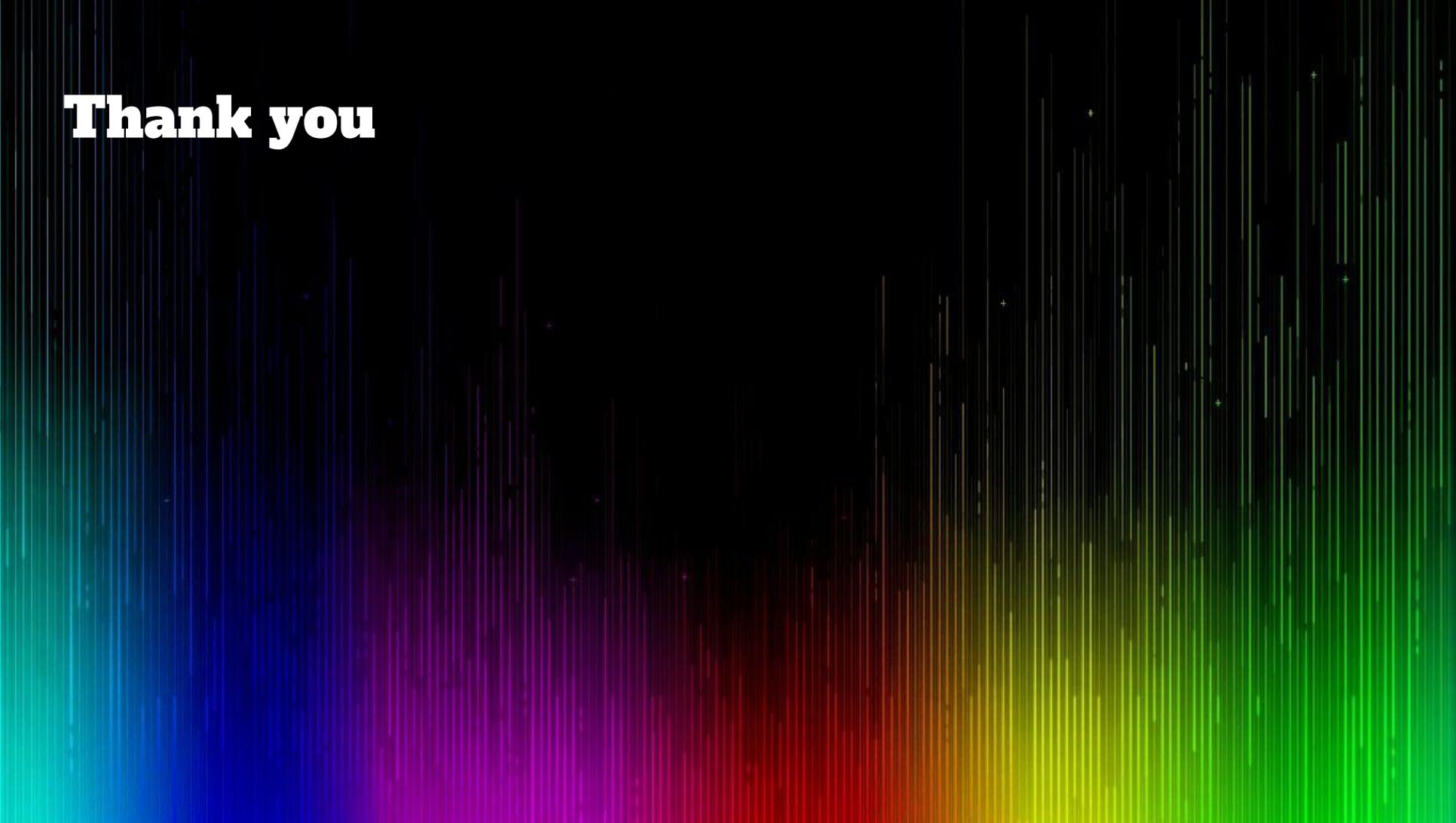
FSM Diagram



Implementation

<https://youtu.be/tchJBduF9JQ>

Thank you

The image features a vertical rainbow gradient background. The colors transition from blue on the left, through green, yellow, and orange, to red on the right. The top portion of the image is black, where the text "Thank you" is written in a bold, white, sans-serif font.