

## Washing Machine Simulation Using PicsimLab

### 1. Overview

#### 1.1 Purpose

This project simulates a washing machine using PicsimLab, aiming to emulate real-world washing machine functionalities in a virtual environment. The simulation involves a detailed understanding of washing machine components, operational cycles, and control mechanisms. Parameters such as fabric type, load size, and water level are utilized to define laundry conditions.

#### 1.2 Scope

The project provides insights into washing machine operations, control system design, and simulation techniques. Participants gain practical experience by applying algorithms to replicate intelligent appliance behavior, enhancing their understanding of laundry automation.

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### 2. Assumptions, Dependencies, and Constraints

#### 2.1 Assumptions

- All peripherals are simulated.
- No real-time hardware interfaces are included.

#### 2.2 Dependencies

- None.

#### 2.3 Constraints

- None.
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### 3 Functional Requirements

#### 3.1 Power ON Screen

**Description:** On resetting the board, the CLCD displays:

*"Press key5 to Power ON Washing Machine."*

The system waits until SW5 is pressed, upon which it displays:

*"Powering ON Washing Machine."*

- **Inputs:** SW5
  - **Process:** Wait for SW5 input, then turn on the machine.
  - **Output:** Display messages for powering on.
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### 3.1.2 Washing Program Screen

**Description:** A menu displays washing programs such as Daily, Heavy, Delicates, Whites, and more.

Using SW4, users can navigate the menu. A long press on SW4 selects the highlighted option.

- **Inputs:** SW4
  - **Process:** Navigate and select a washing program.
  - **Output:** Display available programs, and move to the water level screen upon selection.
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### 3.1.3 Water Level Screen

**Description:** A menu displays water level options: Auto, Low, Medium, High, Max. Using SW4, users navigate the menu. A long press on SW4 selects the highlighted option.

- **Inputs:** SW4
  - **Process:** Navigate and select the desired water level.
  - **Output:** Display water level options, and move to the start screen upon selection.
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### 3.1.4 Start Screen

**Description:** After selecting the washing program and water level, users can start or stop the machine.

- **Inputs:** SW5 (Start), SW6 (Stop)
  - **Process:** Start the machine or go back to the washing program screen.
  - **Output:** Display the selected function and time, then switch to the function screen.
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### 3.1.5 Function Screen

**Description:** Displays the ongoing function (Wash, Rinse, Spin) and remaining time.

- **Inputs:** SW1 (Door status), SW5 (Start), SW6 (Pause)
  - **Process:** Display the function status and time left.
  - **Output:**
    - Display function and time left.
    - If SW1 is pressed, indicate the door is open and sound the buzzer.
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### 3.1.6 Completion Status Screen

**Description:** After completing all programs, display:

*"Program completed. Remove clothes."*

- **Output:** Notify the user of program completion.
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## 4. Output Screens

1. **Power ON Screen**
  2. **Powering ON Screen**
  3. **Washing Program Screen**
  4. **Water Level Program Screen**
  5. **Start Screen**
  6. **Function Screen**
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## 5. Conclusion

The washing machine simulation using PicsimLab effectively bridges theoretical concepts and practical applications in embedded systems. It provides hands-on experience and serves as a foundation for advanced exploration in automation and control systems.