

# Water Tank



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## Introduction

This project develops an automated dual-tank system for efficient water and environmental management. Using a PIC16F877A microcontroller, it integrates ultrasonic sensors for water level monitoring, an NTC thermistor for temperature sensing, and a fan, pump, and solenoid valve for regulation. An LCD provides real-time data, ensuring easy monitoring. This cost-effective system highlights the role of embedded automation in resource management and sustainability.

## Design

This project was designed using a PIC16F877A microcontroller, interfaced with an ultrasonic sensor, a temperature sensor (NTC), a servo motor, a solenoid valve, and a 12V DC water pump. Additional components include an LCD for display, LEDs for status indication, and a power regulation circuit. The system integrates these elements to perform automated control and monitoring tasks effectively.

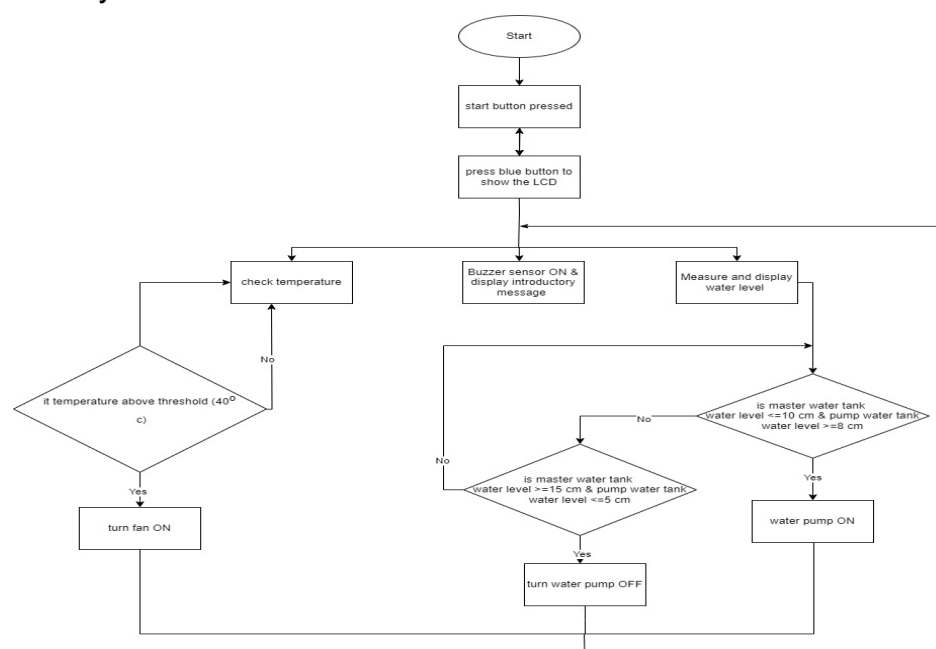


Figure 1: Software Design

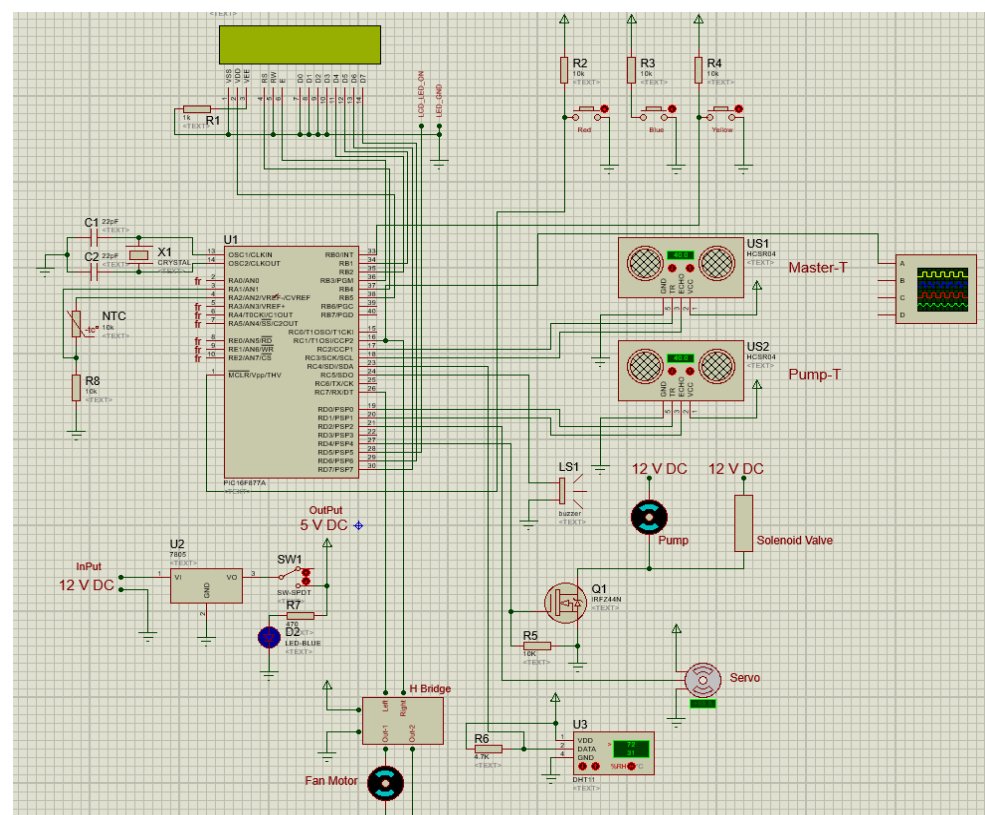


Figure 2: Hardware Design

## Results

Our system successfully met its objectives through intelligent automation. Upon starting, the system activates the buzzer to display an introductory message on the LCD. It measures and displays the water levels in the tanks. If the master tank's water level falls below 10 cm and the pump tank level is above 8 cm, the water pump is turned on. Conversely, if the master tank level exceeds 15 cm or the pump tank level drops below 5 cm, the pump is turned off, ensuring efficient water management. Additionally, the system monitors the temperature and activates the fan if the temperature exceeds 40°C, ensuring optimal operational conditions.



Figure 3: Final implementation

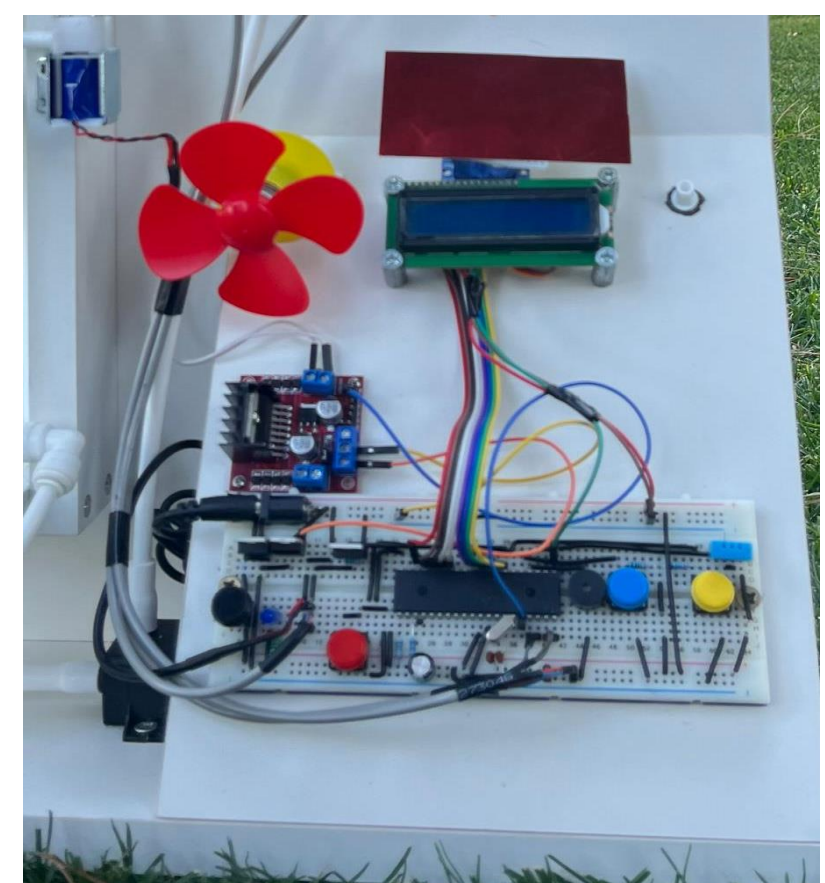


Figure 4: Final implementation

## Conclusion

Although building the dual-tank monitoring system posed challenges, we successfully achieved the desired functionalities and met the project requirements. This process deepened our understanding of embedded systems, sensors, and actuators. It highlighted how microcontroller-based solutions can address real-world challenges while optimizing efficiency and promoting sustainable practices.