



Department Of Electronics and Instrumentation

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Control Systems-I Project Report

MINI CAR

WASHER PROTOTYPE

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1. Introduction:

The Mini Car Washer project aims to create a compact and automated system for cleaning small vehicles such as bicycles, motorbikes, and small cars. This report outlines the design, implementation, and testing of the mini car washer prototype, employing IR sensors, servo motors, Arduino Uno microcontroller, and relays.

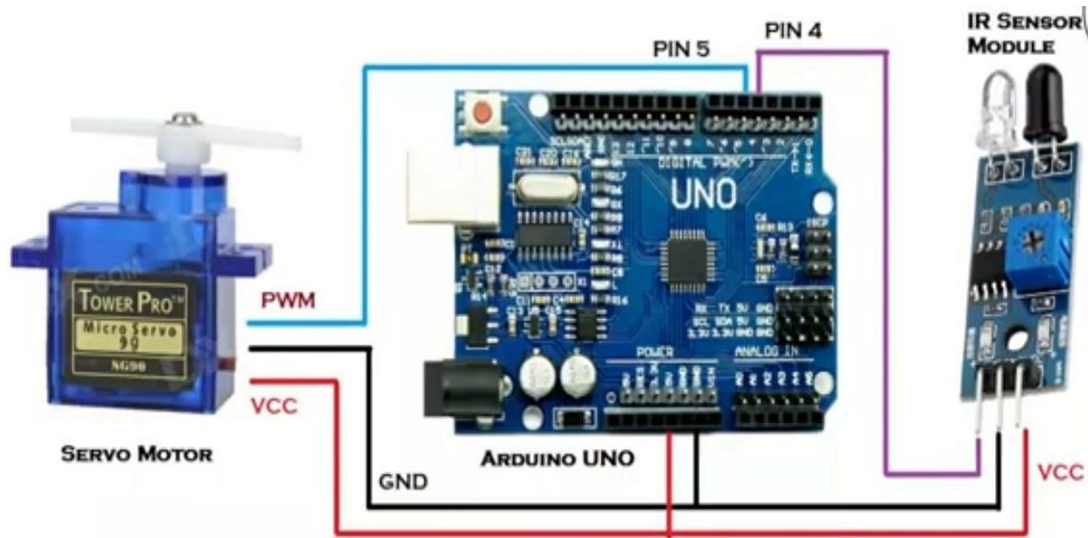
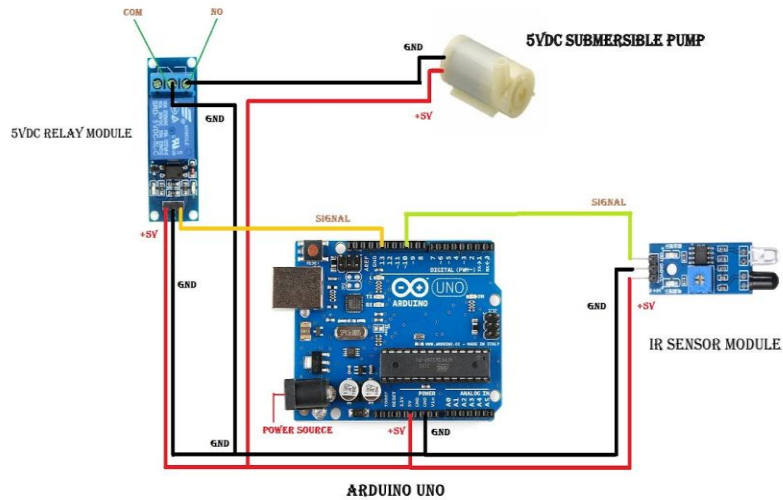
2. Components used:

1. Arduino Uno microcontroller: Central control unit for processing sensor inputs and controlling motor actions.
2. IR sensor: Detects the presence of a vehicle and triggers the washing process.
3. Servo motor: Manages the movement of the wiping arm to wipe off water from different areas of the vehicle.
4. Relay: Controls the ON/OFF operation of the water pump for spraying water.

3. Working Principle: -

The IR sensors constantly monitors the area in front of the car washer unit. - When a vehicle approaches, the first IR sensor detects its presence and sends a signal to the Arduino Uno. - Upon receiving the signal, the Arduino Uno triggers the relay to power the water pump, initiating the spraying of water onto the vehicle. - Consecutively, the second IR sensor sends signal to the Arduino Uno, thus activating the servo motor, which moves the wiping arm to wipe off the water from the vehicle. - After a preset duration or when the vehicle moves away, the Arduino Uno turns off the water pump through the relay.

4. Circuit Diagram: -



6. Implementation: -

Assemble the components according to the schematic diagram. - Write the necessary code to interface the IR sensor, servo motor, and relay with the Arduino Uno. - Upload the code to the Arduino Uno microcontroller. - Test the mini car washer prototype with a small vehicle to verify its functionality and performance.

7. Results and Discussion: -

The mini car washer prototype effectively detects vehicles using the IR sensor and initiates the washing process accordingly. - The relay successfully controls the activation and deactivation of the water pump, providing efficient water spraying during the washing operation. –

The servo motor is equipped with a wiper that aids in drying by removal of the excess water of the mini vehicle's surface body.

8. Conclusion: -

The Mini Car Washer project demonstrates a practical and automated solution for cleaning small vehicles. By integrating IR sensors, servo motors, Arduino Uno, and relays, the system offers a convenient and efficient method for maintaining vehicle cleanliness.

9. Future Enhancements: -

Incorporate additional sensors for enhanced vehicle detection. - Implement a feedback mechanism to monitor water usage and optimize washing efficiency. - Integrate an improved drying mechanism to provide a complete car washing experience.

10. Acknowledgments: -

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