Smart Home Automation integrated with Web Interface and ESP8266 Module

Abstract

The Smart Home Automation project aims to create an efficient, user-friendly, and cost-effective system to control and monitor various home appliances and environmental parameters. By integrating a web interface and ESP8266 module, users can remotely access and control their home devices, ensuring convenience and energy conservation. The system utilizes an Arduino Uno, ESP8266, 4 Channel Relay Module, Water level sensor, magnetic reed switch, and DHT11 temperature/humidity sensor.

Description

The project focuses on developing a smart home automation system that allows users to control and monitor their home appliances and environmental conditions through a web interface. The system is built using an Arduino Uno microcontroller, which acts as the central processing unit. The ESP8266 module enables Wi-Fi connectivity, allowing users to access the system remotely. The 4 Channel Relay Module controls various appliances, while the Water level sensor, magnetic reed switch, and DHT11 temperature/humidity sensor monitor and provide feedback on environmental parameters.

Components Used

1. **Arduino Uno:** A microcontroller board based on the ATmega328P, used as the central processing unit for the system.

2. **ESP8266:** A low-cost Wi-Fi module that enables wireless communication and remote access to the system.

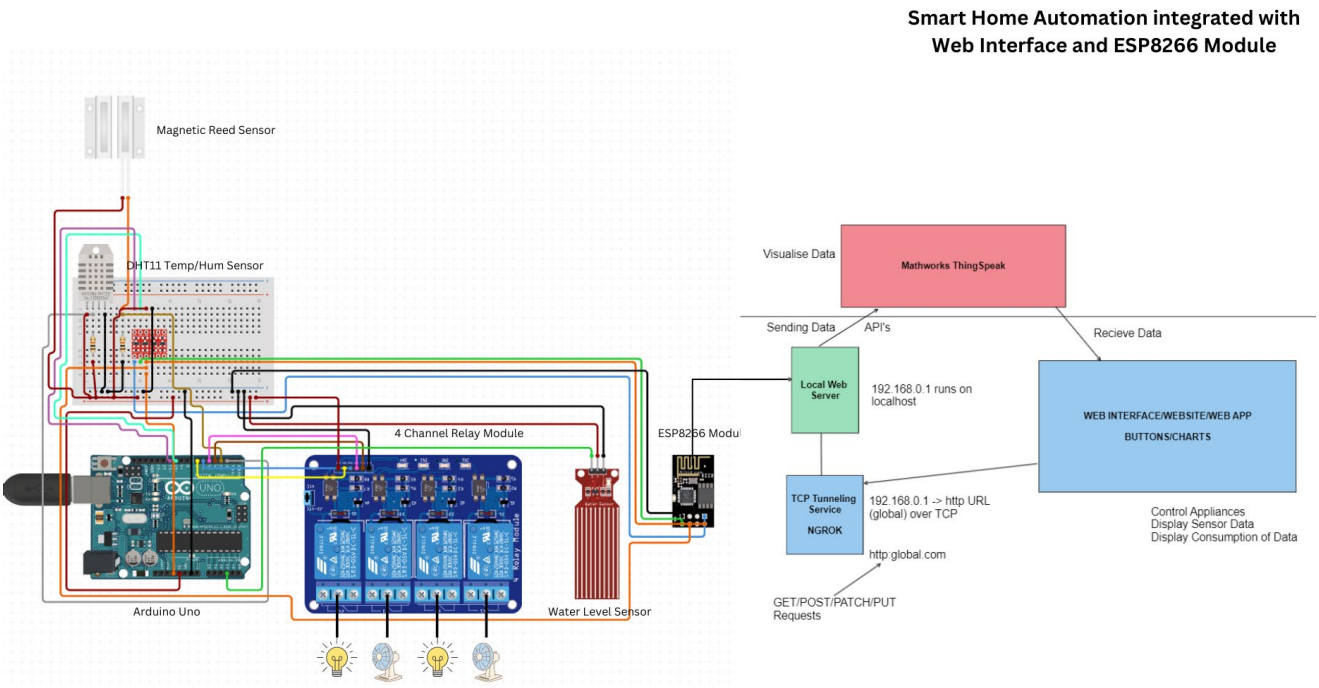
3. **4 Channel Relay Module:** An interface that allows the Arduino to control high-voltage appliances safely.

4. **Water Level Sensor:** A sensor that detects the water level in a container, providing feedback for water management.

5. **Magnetic Reed Switch:** A switch that detects the opening and closing of doors or windows, enhancing home security.

6. **DHT11 Temperature/Humidity Sensor:** A sensor that measures ambient temperature and humidity, providing data for climate control.

Circuit Diagram



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