

Actuator Module Code Documentation

Overview

This Arduino code is designed for an Actuator Module, leveraging ESP8266 for connectivity and ThingSpeak for data communication. The Actuator Module is a versatile device capable of receiving commands from a ThingSpeak channel and controlling various outputs, such as LEDs, based on the received data. The code ensures seamless integration with WiFi networks and provides a reliable mechanism for interfacing with the ThingSpeak cloud platform.

Author

- **Name:** Varad Chaskar
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Purpose

The primary purpose of this code is to enable the Actuator Module to interact with the ThingSpeak cloud service. It reads data from specified fields of a ThingSpeak channel, interprets the values, and performs corresponding actions, such as controlling LEDs or other actuators. The Actuator Module can be used in scenarios where remote control and monitoring are essential, making it suitable for home automation, industrial applications, or any environment requiring dynamic actuation based on real-time data.

Dependencies

- **WiFiManager Library:** Used for simplifying the configuration of WiFi settings.
- **ESP8266WiFi Library:** Provides necessary functionality for WiFi communication.
- **ThingSpeak Library:** Facilitates communication with the ThingSpeak cloud platform.

Configuration

Before uploading this code to the Actuator Module, ensure that the following parameters are correctly configured:

- **`myChannelNumber`:** The ThingSpeak channel number where data is to be read.
- **`myWriteAPIKey`:** The Write API key for updating the ThingSpeak channel (if applicable).

- **`myCounterReadAPIKey`**: The Read API key for reading data from the ThingSpeak channel.

Usage

1. Setup:

- Connect the Actuator Module to the desired hardware, such as LEDs, using the specified GPIO pins.
- Upload this Arduino code to the Actuator Module using the Arduino IDE or any compatible platform.

2. Configuration:

- Power on the Actuator Module.
- The Actuator Module will attempt to connect to a WiFi network. If not already configured, it will enter into a configuration mode ("ASAA" in this example) to allow WiFi setup.

3. ThingSpeak Integration:

- Ensure that the ThingSpeak channel specified by ``myChannelNumber`` contains the required fields for controlling the actuators.
- Customize the code based on the ThingSpeak fields used for controlling LEDs or other actuators.

4. Operation:

- Once connected to WiFi, the Actuator Module will continuously read data from the specified ThingSpeak fields.
- Actuation logic is implemented based on the received data, controlling LEDs or other outputs accordingly.

Error Handling

- If the Actuator Module fails to connect to WiFi, it will blink the built-in LED and attempt to reconnect.
- The Actuator Module may restart if WiFi connection issues persist.

Additional Notes

- Ensure the correct pin mappings for actuators and LEDs in the code.
- Customize actuation logic based on specific use case requirements.