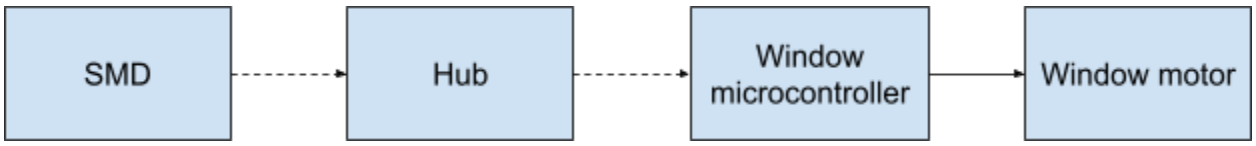
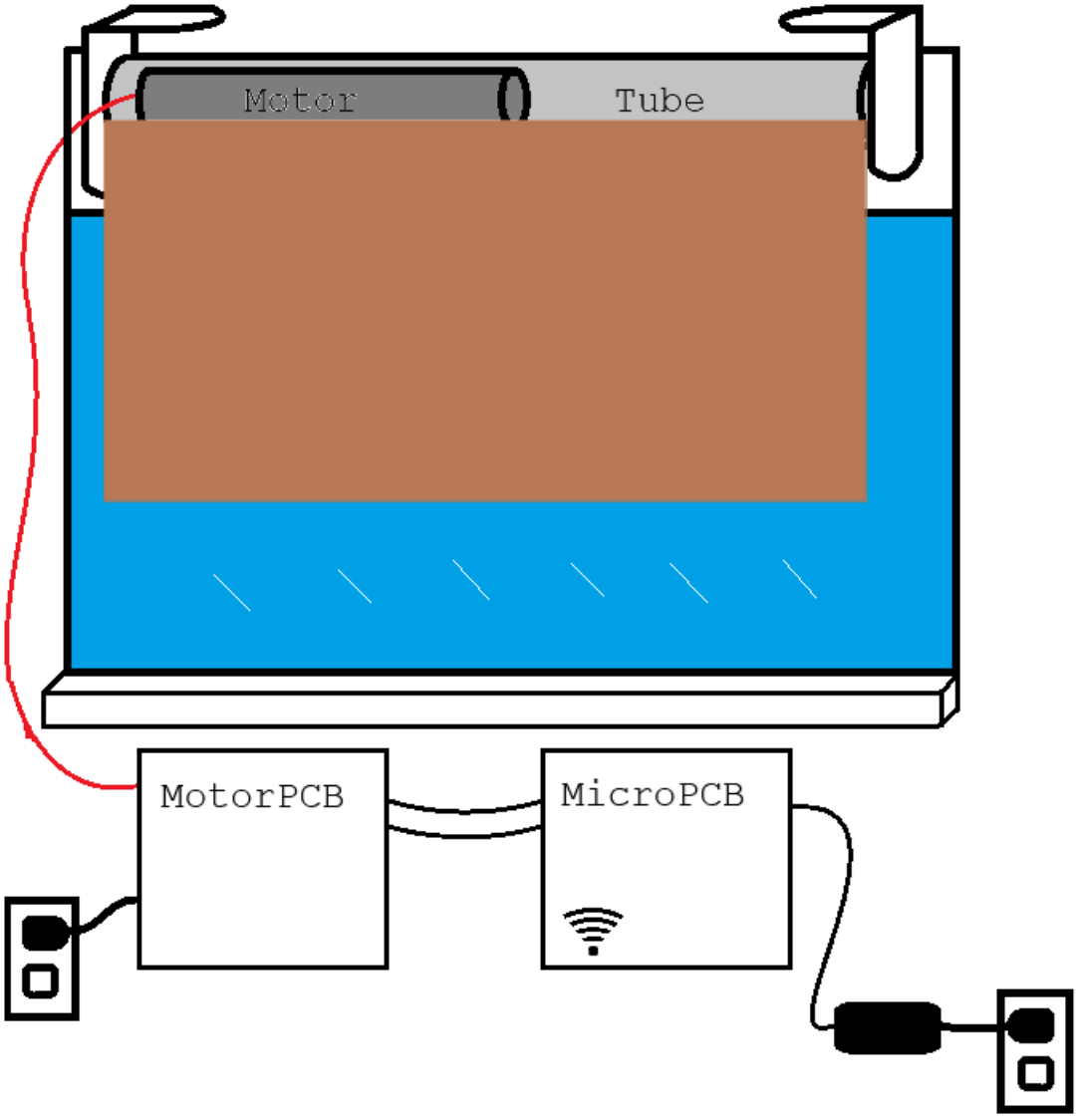
What is it?

The Smart Window Shades is a window shade controller that is designed for residents to control their window blinds through the kick buttons and a smart mobile device UI interface. The window shade consists of various components, such as the motor, a PCB (high voltage) that controls power to the window shade control system, and another PCB (low voltage) that controls communication with the hub.

What is the structure?





How does it work?

The main function of the device is to simply operate a motor up and down. It completes this function with the use of two PCBs, one with power distribution from a wall outlet and another with a microcontroller that will communicate with the hub and allow for control of the overall device. The power distribution PCB, or the MotorPCB, utilizes relays to switch on and off the motor as well as the direction of the motor, and hence the shades. Meanwhile, the MicroPCB uses DC 12V as power and sends signals to the MotorPCB through wired connections to switch the relays.

The microcontroller, Raspberry Pi Pico W, utilizes PlatformIO and C++ as the compiler and code language. The Pico W communicates with the hub through Wi-Fi using the MQTT protocol. It uses the ArduinoHA library to communicate automation functions with the HUB [1].

Sources

1- ArduinoHA documentation- link