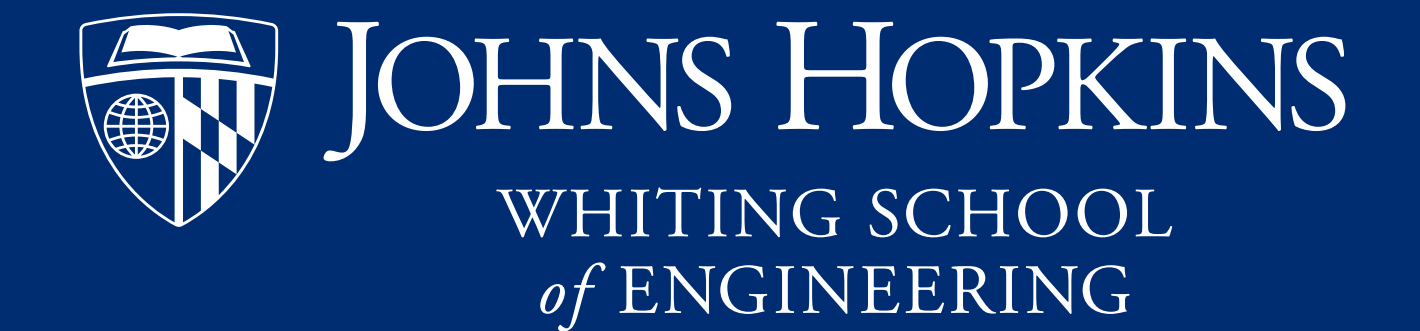


Smart Home Automated Blinds System Powered By IoT Electric Imp

Alexander Shen

Johns Hopkins University | Whiting School of Engineering | Baltimore, MD
Design Day 2024



Introduction

The Internet of Things (IoT) refers to a network of physical objects (things) that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the internet. An application of IoT is smart homes. I designed an automated blinds system where users can use a web interface to control the blinds, check the status, and the blinds can open and close at certain times.

Objectives

The blinds should be able to seamlessly connect with the web inputs, receiving data from light sensors and working in real time.

Materials and Methods

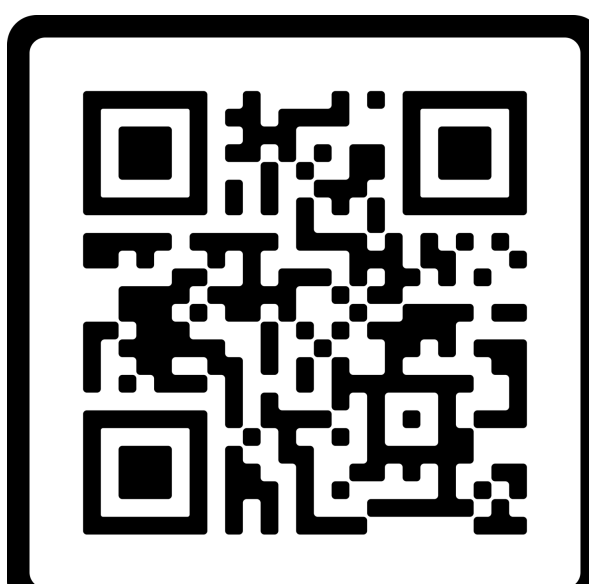
The Electric IMP has two "areas" for code. This is the device and agent. The Device code communicates directly with the IMP's nodes and is in squirrel. The Agent code lets me use html and javascript in conjunction with squirrel code to communicate with the device and the internet.

I created the blinds out of cardboard tubes and paper, epoxying them together to the motor and using solder to create long wire connections

Next Steps

I can use stronger motors, fabric, and a premium email service to create a "real" set of blinds with perfect functionality. This should work the same in theory but will take more resources.

References



SCAN ME

I'd like to extend my sincere thanks to Professor Robert E Glaser for his vital teaching, guidance, and continuous support throughout every phase of this project. I couldn't have done this without his help.

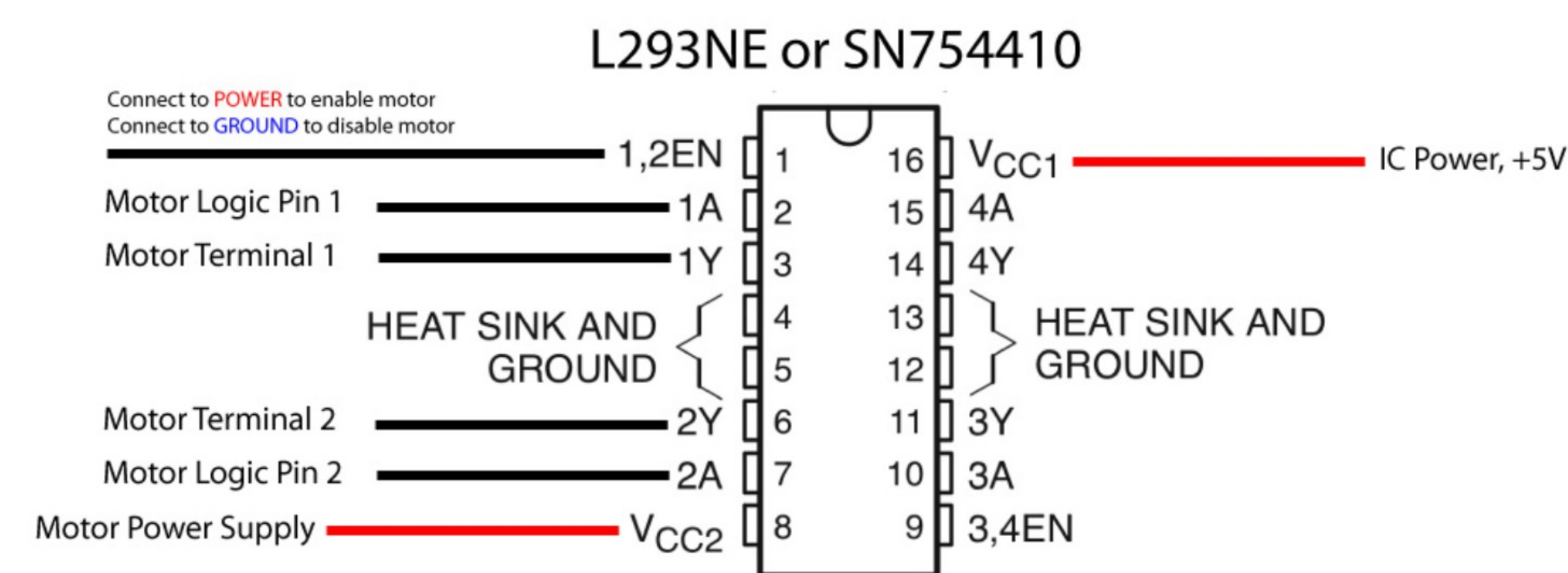


Figure 1: SN754410 Motor Driver Datasheet

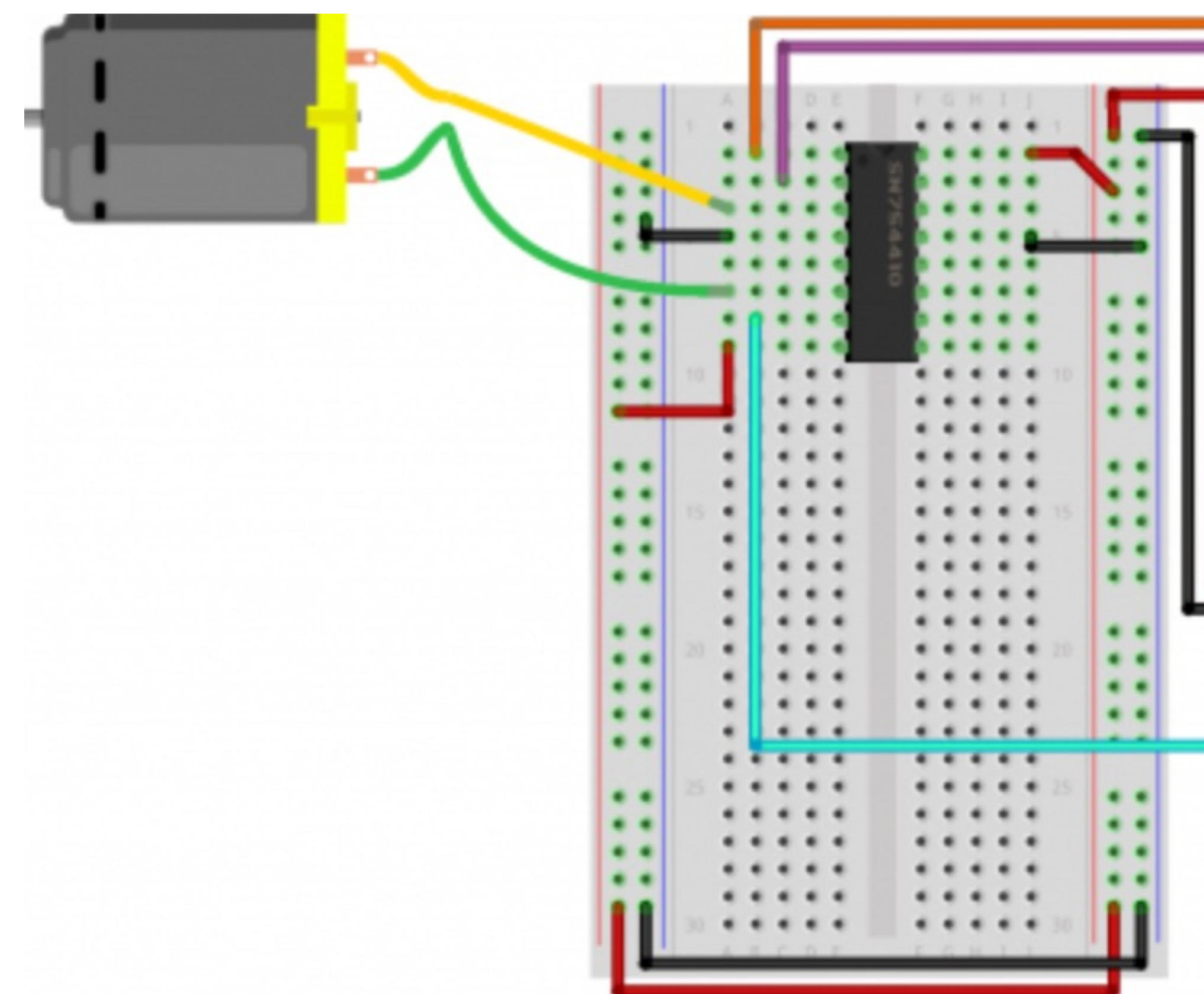


Figure 2: Motor Wiring Diagram

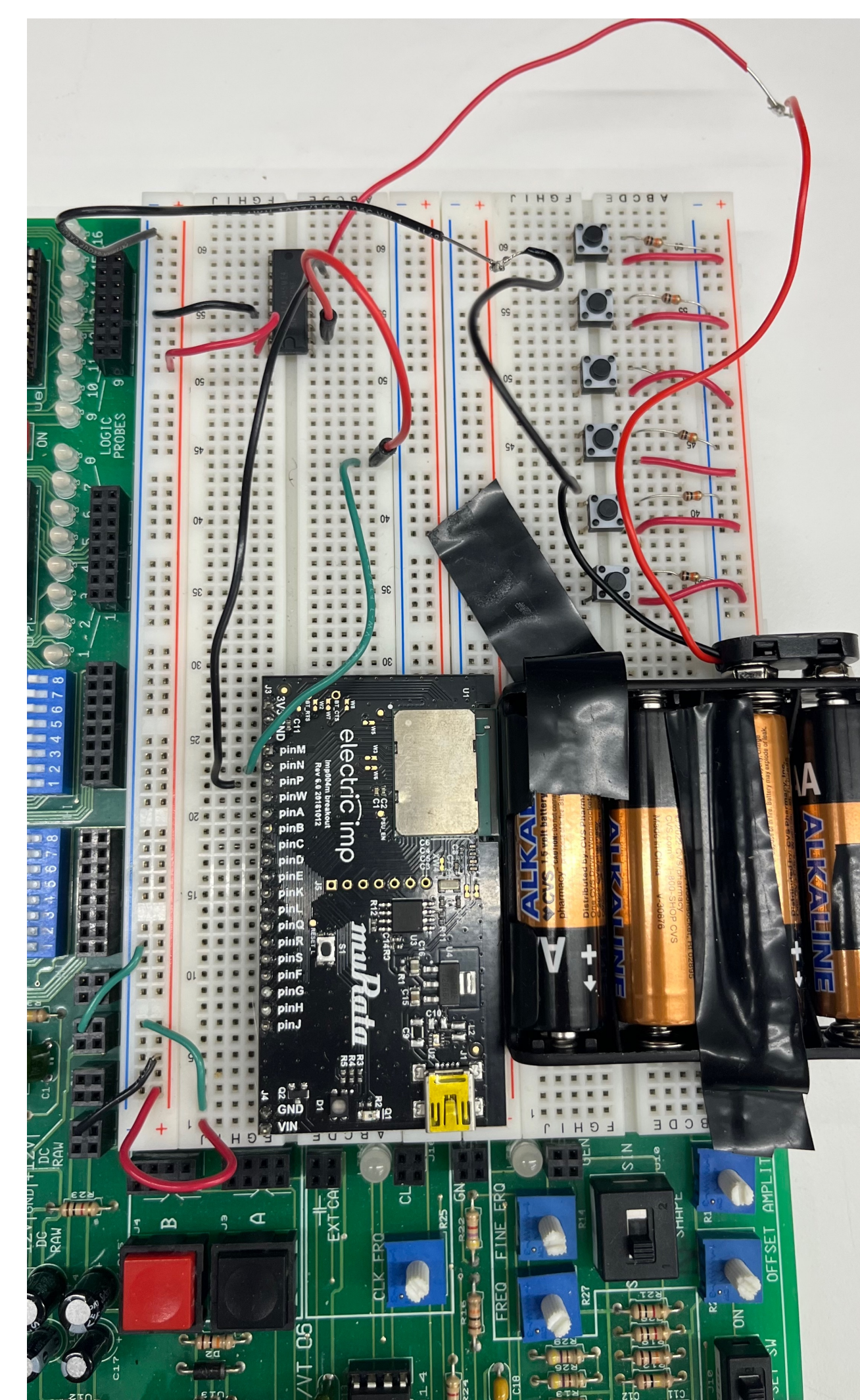
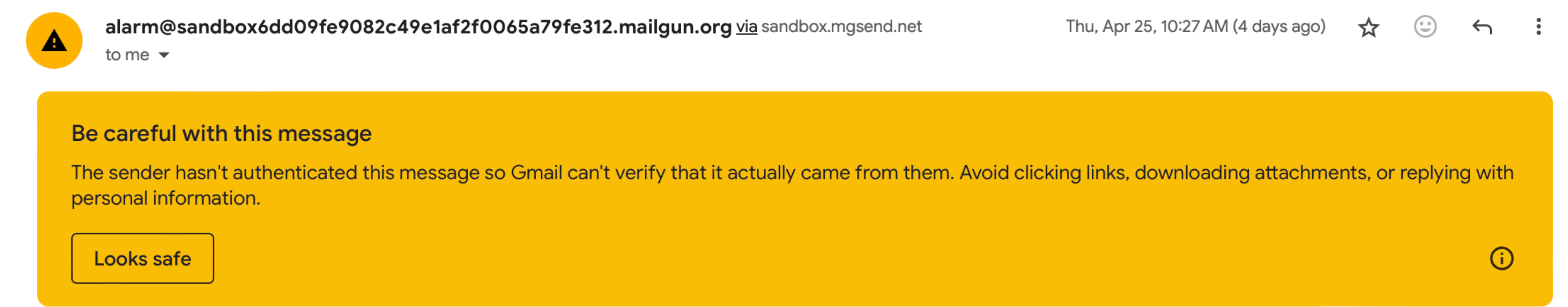


Figure 3: Wire Connections with external Power Source

The two wires on the motor are attached to each Motor Terminal pin. Two voltage outputs from the Electric IMP are connected to each Motor Logic pin. I chose to use Pin P and Pin N. I connected one wire from the battery to the VCC Pin and one to the GND Pin.

Results



blinds are open!

Figure 4: Status Email when Blinds are Open, sent using Mailgun service with sandbox testing email accounts.

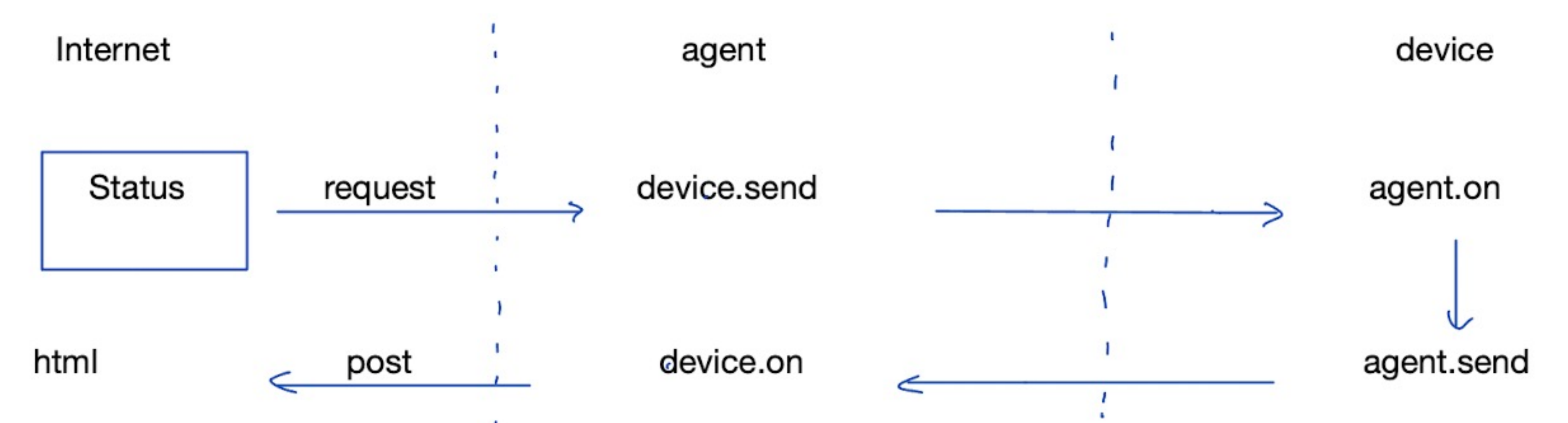


Figure 5: Internet to Agent to Device Communication

Automated Blinds!!

Control the blinds with these buttons!

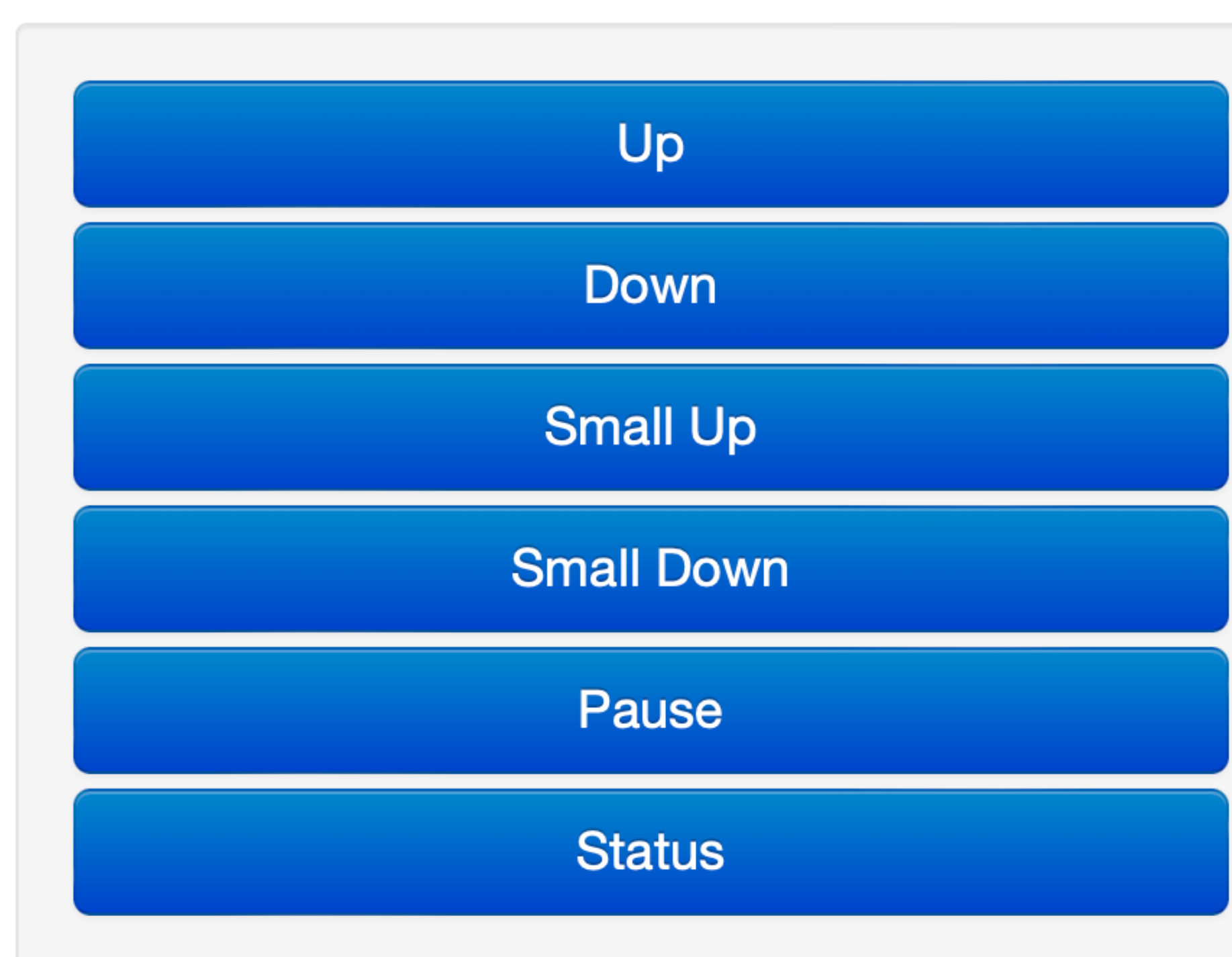


Figure 6: Web interface to control blinds Up and Down Retract and Release the blinds for the full length. Small Up and Small Down make small adjustments. Pause instantly stops the movement. Status sends a status email.



Figure 7: Blinds