### Introduction

Many assistive switches are the momentary type; however, it is often desirable to use such switches in a toggle switch manner to allow long duration use of a switched device.

# Problem Definition

## Who

Who will be using the device?

* Users who are unable (or prefer not) to activate an assistive switch for extended time periods.

Who will be affected by the device?

* Users who wish to control lights and other devices in a semi permanent manner, by utilizing their preferred momentary assistive switches.

## What

What must the device do?

* Set a toggle switch output to it’s opposite state, whenever the assistive switch is connected to the input, and enabled.

What needs must the device serve?

* Ability to control lights, tools, music effects, or toys for long durations.

## Why

Why will the device be used?

* Because existing assistive switches are usually momentary, and toggleable switches are unlikely to be found in many assistive switch classes.

## Where

* In homes, offices, or other work environments.

## When

* When a device needs to be enabled for more than a few seconds.

# Functional Properties

## Goals

|  |  |
| --- | --- |
| **ID** | **Description** |
| G01 | Cost-effective |
| G02 | Optimized for low-volume builds (I.e., 1) |
| G03 | Open-Source Hardware |
| G04 | Enable a momentary assistive switch to toggle (latch) a switch controllable device. |
| G05 | Minimize material cost |
| G06 | Sustainability |

## Functional Requirements

|  |  |
| --- | --- |
| **ID** | **Description** |
| F01 | The device shall have one or more input channels. |
| F02 | Long duration operation (many days of operation on battery power). |
| F03 | The device should have a visual feedback element to indicate switch activation ( Example: LED) |
| F04 | The device should allow activation by plugging a cable into the input jack and should default to a non-closed connection. |
| F05 | The OpenAT Switch Latch should have a power switch to reduce power consumption when not being used. |
| F06 | The battery hatch should provide a screw to prevent children from swallowing the lid or the battery underneath. |
| F07 | The device should have a capacitor for input circuit switch input debouncing, as the device will not be able to achieve this using software. |
| F08 | When off, the circuit must activate (and stay active) when a switch input is triggered. |
| F09 | When on, the circuit must de-activate (and stay off) when a switch input is triggered. |
| F10 | The circuit must contain some form of switch debouncing circuitry to keep operation reliable. |

## Non-functional Requirement

|  |  |
| --- | --- |
| **ID** | **Description** |
| NF01 | Shall look professional with tight tolerance on case size. |
| NF02 | Input ports should be legibly labelled for easy identification |
| NF03 | The device should require no mechanical force to operate. |
| NF04 | The device should have a long battery life. |
| NF05 | The toggle Adapter should use a minimum of electronic parts. |

## Constraints

|  |  |
| --- | --- |
| **ID** | **Description** |
| C01 | The OpenAT Switch Latch must be able to be constructed using basic ‘maker’ tools. |
| C02 | The OpenAT Switch Latch should be able to be disinfected using detergent and alcohol. |