# Overview

This document contains the necessary information to build the Raindrop Switch, a small affordable assistive switch.



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# Maker Checklist

This list provides an overview of the steps required to build and deliver the Raindrop Switch

## Maker To Do List

* Read through the Maker Guide to become familiar with required components, tools, supplies, safety gear, and overall assembly steps.
* Talk to the User about customization options
  + Switch base and cap can be printed in different colours
  + How they would like to receive the “User Guide”
* Order hardware components
* Gather tools, supplies, and safety equipment.
* Assemble the device
* Test the Raindrop switch
* Print “User Guide” (if the User would like a physical copy)

## Items to Give to User

* Raindrop switch
* “User Guide”

# Tool List

## Tools / Equipment

|  |  |  |  |
| --- | --- | --- | --- |
| Tool ID | Description | Required / Recommended | Notes |
| T01 | Flush Cutters | Required | Trimming unused parts of the button |
| T02 | Soldering Iron | Required | Connecting the button and the cable |
| T03 | Hot Glue Gun | Required | Securing the switch components to the base |
| T04 | Pliers | Recommended | Straightening the leads to the button |
| T05 | Wire Strippers | Required | Cutting the cable, and stripping the component wires |
| T06 | Soldering Jig | Optional | Holds the button and cable in place for soldering |

## Supplies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Supplies ID | Description | Quantity | | Notes |
| S01 | Tactile Button | 1 | Button of the switch | |
| S02 | Mono Cable | 1 | Cable of the switch | |

## Personal Protective Equipment (PPE)

|  |  |  |
| --- | --- | --- |
| PPE ID | Description | Notes |
| P01 | Safety Glasses | Protecting your eyes |

# Customization Guide

The device can be printed in the user’s desired colour.

The base and cap can be printed in the same colour or printed in different colours.

# 3D Printing Guide

The device was originally printed on an Ender 3 using Cura.

Default slicer profile was used for all prints.

## 3D Printing Summary

|  |  |
| --- | --- |
| **Metrics** | **Single Unit** |
| Total Print Time (min) | 56min |
| Total Number of Components | 3 |
| Typical Total Mass (g) | 6g |
| Typical Number of Print Setups | 1 |

## 3D Printing Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Print File Name** | **Qty** | **Total Print Time (hr:min)** | **Mass (g)** | **Infill (%)** | **Support(Y/N)** | **Layer Height/ Nozzle Diameter(mm)** | **Notes** |
| Raindrop\_Base\_v1.2.stl | 1 | 0:12 | 1 | 20 | N | 0.2/0.4 |  |
| Raindrop\_Cap\_v1.0.stl | 1 | 0:08 | 1 | 20 | N | 0.2/0.4 |  |
| Switch\_Jig\_12mm\_v1.0.stl | 1 | 0:36 | 4 | 20 | N | 0.2/0.4 |  |

## Post-Processing

Inspect the 3D printed parts for any printing defects, sharp edges, or burrs. Sharp edges and burrs can be removed with sanding or deburring tools.

## Examples of Quality Prints

Compare your 3D prints to the images here. If there are significant differences, you may need to reprint the part.

|  |  |  |
| --- | --- | --- |
| Raindrop Switch | | |
| Raindrop\_Base\_v1.2.stl | Raindrop\_Cap\_v1.0.stl | Switch\_Jig\_12mm\_v1.0.stl |
|  |  |  |

# Maker Component List

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raindrop Switch | | | | | | | | | | | | | | |
| A01 | Tactile Button | | | QTY: 1 | A02 | Mono Cable | | | QTY: 1 | A03 | Raindrop Base | | | QTY: 1 |
|  | | | | |  | | | | |  | | | | |
| A04 | | Raindrop Cap | QTY: 1 | |  | |  |  | |  | |  |  | |
|  | | | | |  | | | | |  | | | | |

### Part A: Required Tools and Supplies

* Flush Cutters
* Soldering Iron
* Hot Glue Gun
* Pliers
* Wire Strippers
* Switch\_Jig\_12mm

### Part A: Required Personal Protective Equipment (PPE)

* Safety Glasses

### Part A: Raindrop Switch Assembly Steps

#### Step A-01: Trim the button leads

Cut off the two leads flush on one side of the button (A01) using the flush cutters (T01)

A close up of a blue button

Description automatically generated

#### Step A-02: Bend the remaining leads

Take the two remaining leads on the button, and bend them 90 degrees using pliers (T04)

A close-up of a small blue and black device

Description automatically generated

#### Step A-03: Trim the mounting lugs

Cut off the two plastic mounting lugs completely flush using flush cutters (T01)

A close up of a device

Description automatically generated

#### Step A-04: Cut the mono cable in half

Using flush cutters(T01), cut the mono cable (A02) in half

A pair of black audio cables

Description automatically generated

#### Step A-05: Thread the cable onto the base

Thread the cut end of one half of the mono cable through the hole in the base of the switch(A03)

A blue cable with a hole in it

Description automatically generated with medium confidence

#### Step A-06: Strip the end of the cable

Using wire strippers(T05), strip the last two centimeters of the mono cable. Twist the loose copper into a solid strand.

A close up of a wire

Description automatically generated

#### Step A-07: Strip the interior cable

Strip the insulation off the remaining cable, and twist the loose wires into a solid strand.

A close-up of a wire

Description automatically generated

#### Step A-08: Wrap the wires around the switch leads

Hold the wire behind the switch and wrap the wire around the switch leads with a plier.

A close-up of a device

Description automatically generated

#### Step A-09: Bend the wire

Hold the switch in place and bend the wire in between the two switch leads

A close-up of a small device

Description automatically generated

#### Step A-10: Solder the cable to the button

Solder the cable to the leads on the switch using a soldering iron(T02). The soldering jig(T06) can be used to hold the assembly together while soldering. **IMPORTANT: After soldering the two leads, test the switch by following the instructions in the testing section.**

A close-up of a blue device

Description automatically generated

#### Step A-11: Move the case closer to the switch

Pull the cable through the base so that the switch assembly is much closer to the base.

A close-up of a cable

Description automatically generated

#### Step A-12: Add hot glue to the base

Add a small drop of hot glue (T03) to the base. Do not add too much, a pin head sized blob is enough.

A close-up of a device

Description automatically generated

#### Step A-13: Press the switch into the base

Press the switch into the recess in the base with the hot glue drop in it. Make sure the switch is sitting level in the case.

A close-up of a cable

Description automatically generated

#### Step A-14: Add hot glue onto the cap

Add a small drop of hot glue in the square recess in the cap. Do not add too much.

A close-up of a blue object

Description automatically generated

#### Step A-15: Press the assembly onto the cap

Press the knob on the switch into the hot glue on the cap. To prevent hot glue in the cap from oozing downwards, press the case assembly onto the cap.

A close up of a blue object

Description automatically generated

#### Step A-16: Fill the hollow on the switch bottom

Fill the hollow on the bottom of the switch with hot glue to secure the cable.

A blue object with white label

Description automatically generated with medium confidence

# Testing

Using a switch tester, test that the switch is working. The light should turn on when the switch is pressed, and turn off when the switch is released.

# Troubleshooting

If the switch is not working properly, check the solder joints between the button and cable to make sure the cable has not come loose from the cable.

If the lead on the button has broken off, replace it with a new button.

If the wire has broken off the cable, cut the cable back a centimeter and repeat steps 6-10 to reattach the cable.