Zelda LED UltraHand
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https://learn.adafruit.com/ultrahand

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Overview

You can build a prop replica of Link’s Ultra Hand from The Legend of Zelda, Tears of the Kingdom.

We were inspired by Link’s new ability and used LED noodles to make it into a glowing 3D printed prop.

It’s a two piece wearable prop that fits over your arm and the palm of your hand.

The arm band has 3 LED noodles wired in series that are powered by a 9V battery while the palm uses a single LED noodle with a coin cell.

The battery holders feature switches that are easy to get to for quickly turning the LEDs on and off.

The LED noodles are pretty bright compared to EL wire and it’s even visible during the day.
Parts

nO0ds - Flexible LED Filament - 3V
300mm long - Lime Green

Our favorite food when hacking on code or electronics is a hot bowl of noodles - and around NYC these are often called 'noods'! What we've got here are flexible LED...

https://www.adafruit.com/product/5507
Single CR2032 / 20mm Coin Cell Battery Holder with Switch
This tiny coin cell battery holder is ideal for small portable or wearable projects. It holds one 20mm coin cell (also known as CR2032) in series to generate 3V nominal. 20mm coin...
https://www.adafruit.com/product/4856

JST PH 2-Pin Cable - Female Connector 100mm
Red and black tinned wires with a 2-pin JST PH connector on the end. 4" / 100mm long. Matches up nicely with our Lipoly chargers!
https://www.adafruit.com/product/261

JST PH 2-Pin Cable – Male Header 200mm
For a really long time we assumed that the JST PH didn't have a free-hanging male header version. But then we found this JST-PH 2-pin Male Cable, and we were...
https://www.adafruit.com/product/3814

9V battery holder with switch & 5.5mm/2.1mm plug
This is a 9V battery pack with on/off switch and a pre-attached 5.5mm/2.1mm center-positive barrel plug. Use this to battery-power your Arduino (or other electronic projects)...
https://www.adafruit.com/product/67
**Alkaline 9V Battery**
Battery power for your portable project!
These batteries are high quality at a good price and work fantastic with any of the kits or projects in the shop that use 9V. These...
https://www.adafruit.com/product/1321

**CR2032 Lithium Coin Cell Battery**
A perfect match for our sew-able coin cell holder. This non-rechargeable coin cell is CR2032 sized: 20mm diameter, 3.2mm thick. It...
https://www.adafruit.com/product/654

4 x M2.5x6mm Screws
M2.5x6mm Screws

2 x 10Ω Resistor
10Ω Resistor

2 x Elastic Rubber Band
Elastic Rubber Band
3D Printing

Parts List

The STL files for 3D printing are oriented to print "as-is" on FDM style machines. Parts are designed to 3D print. Original design source files may be downloaded using the links below.

Edit Small Design
Edit Design
Download STLs
Slice with Settings for PLA Material

The parts were sliced using CURA with the slice settings below.

- PLA filament 200c extruder
- 0.25 layer height
- 10% gyroid infill
- 60mm/s print speed
- 60c heated bed
- Brim line count 6

Supports

- Support Overhang Angle: 50
- Support Destiny: 6%
- Enable Support Interface
- Enable Support Roof
- Support Z Distance: .21

Circuit Diagram

The diagram below provides a visual reference for wiring of the components. This diagram was created using the software package [Fritzing](https://fritzing.org). On the Assemble page you'll see photos and steps for soldering together these circuits.
Adafruit Library for Fritzing

Use Adafruit’s Fritzing parts library to create circuit diagrams for your projects. Download the library or just grab individual parts. Get the library and parts from GitHub - Adafruit Fritzing Parts.

Arm Wiring

You will solder the LEDs together in series, and connect the positive end of the LED to the negative end of the next nOOd.

10Ω resistor to nOOd cathode (negative)

Positive to nOOd Anode (positive)
Wrist Wiring

You'll solder the positive end (end with a hole) of the LED to the positive wire on the coin cell case.

Then, you'll solder the negative end to GND on the battery case.

10Ω resistor to nOOd cathode (negative)

Positive to nOOd Anode (positive)

Assemble

How to tell + and - ends
nOods LED strips have distinct anode (“plus”) and cathode (“minus”) ends. If a nOOd doesn’t light, you might just need to flip it. The anode end can be identified by a teeny-tiny hole in the metal end tab.

You can read the nOods Überguide guide here: https://learn.adafruit.com/noods-uberguide

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Start by soldering together the LED noodles in series with the cathode connecting to the anode.

This current limiting resistor is soldered to the ground wire of a JST connector for a plug-in-play assembly.
The LED noodles are press fitted into the built-in channels on the outside of the arm band.

This joint was soldered at a right-angle to accommodate the design of the channel.
The wider channel allows the noodle to bend on itself for a tight fit.

Solder the red JST wire to the anode side of the noodle. The wire press fits between the slit inside the channel.
Hot glue secures the JST cables wiring to the inside of the arm band to keep it concealed.
A separate mounting plate is secured with screws for the 9V Battery holder.
We’ll replace this battery’s DC barrel jack with a 2-pin JST cable so we can plug it into the LED noodles.

Solder the wire with the White Strip print to the Red wire on the JST plug.

The wire with printed text connects to the Black wire on the JST plug.
Then we can snap fit the cover over the battery holder to blend it into the prop.

Now we can use the battery holder's slide switch to power it on!
Press fit a single LED noodle into the channel of the palm piece with the ends near the notch.

Secure the coin cell battery mount and fit the battery holder into place with the snap fit cover placed on top.
Align the wire and slide switch on the battery case to the cut outs on the mount.

Press fit the lid over the battery holder.
Solder the battery cables to the noodle pins with an in-line resistor. Remember to add heat shrink tubing to insulate the connections.

Now you can use the switch to power it on!