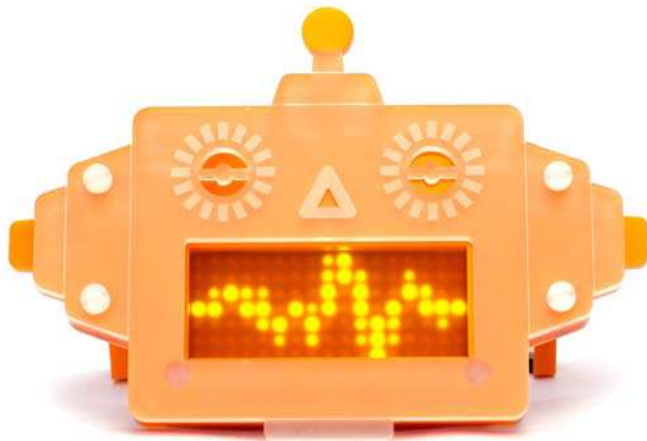# Scroll Bot - Pi Zero W Project Kit

PIM260

A robot friend to sit on your desk and scroll the news, weather, or your Twitter feed - Scroll Bot!

The Scroll Bot Kit* combines the Pi Zero W with our new swish Scroll pHAT HD board, and masquerades as a friendly orange robot, perfect for sitting on your desk or on a shelf. It's ideal for scrolling messages or for simple animations and, of course, it takes advantage of the built-in wireless LAN on the Pi Zero W. It'll take around 30 minutes to assemble everything** (check out our assembly guide for details).

Kit contents*

- Pi Zero W
- Scroll pHAT HD with 17x7 individually dimmable white LEDs
- Male and female 2x20 pin headers
- Orange robot stand and diffuser
- 50cm USB A to micro-B cable
- USB A (female) to micro B (male) adaptor
- Mini to full-size HDMI adaptor
- Sticker sheet (personalise your Scroll Bot!)
- Comes in a reusable kit box

*Just add your own micro-SD card
Note that this is a soldering project, although you could use one of no-solder hammer headers!

Scroll Bot uses our new Scroll pHAT HD board, a dense matrix of 17x7 (119 total) bright white LEDs. Each pixel's brightness can be controlled individually, meaning that it's possible to create stunning animations or even anti-aliased text. The LED matrix sits behind Scroll Bot's mouth, and the frosted orange acrylic diffuses the LEDs beautifully.

Use the built-in wireless LAN to make your Scroll Bot internet-connected and have him/her/it inform you of the latest news, weather, track hashtags or mentions on Twitter, or much, much more.

Features

- 17x7 matrix of bright white pixels (119 total)
- Individual PWM brightness control of each pixel
- Uses the IS31FL3731 LED matrix driver chip
- 3-layer orange robot stand and diffuser
- Pi Zero W with single core CPU and built-in wireless LAN and Bluetooth
- Adaptor kit
- 50cm USB A to micro-B cable (power your Pi from an existing charger or computer)
- Python library https://github.com/pimoroni/scroll-phat-hd
- **Female and male headers require soldering**

Software

Our handy one-line installer will install the Scroll pHAT HD Python library for you. We've included a bunch of examples too, to show off what you can do with Scroll pHAT HD.

Note that the default orientation for Scroll pHAT HD is upside-down if you're using it in a Scroll Bot. To flip it, simply add `scrollphathd.rotate(180)` towards the top of your code, just below the import lines.

Notes

Assembled size of Scroll Bot is 125x85x67mm (WxHxD).

Assembling Scroll Bot

This tutorial will guide you through how to assemble your Scroll Bot kit. Scroll Bot is a robot friend that lives on your desk or a shelf on your bookcase, and keeps you up to date with news, the weather, or your latest mentions or hashtags on Twitter.

Scroll Bot uses our new Scroll pHAT HD board, with a 15x7 matrix of individually controllable (per-pixel PWM-dimming) bright white pixels. It's ideal for scrolling messages, a 17-band spectrum analyser for your audio, or simple animations or games.

The assembly will be split into two parts: soldering the headers to your Pi Zero W and Scroll pHAT HD, and assembling and screwing together the acrylic pieces.

It should take around 30 minutes to assemble everything.

Soldering the headers

Both the Pi Zero W and the Scroll pHAT HD boards will need a 2x20 pin header attached. Your Scroll Bot kit comes with a male 2x20 pin header for the Zero W and a female 2x20 pin header for the Scroll pHAT HD.

We have a guide here that you can follow to learn how to solder headers to pHATs. Soldering the male header to the Zero W is essentially just the same process, except the header should be soldered on top. The photos below show how each header should look when soldered.

If you don't own a soldering iron, or you're just not a pro-solderer yet, then you could use one of our nifty hammer headers that don't require any soldering at all. Our hammer header kit comes with a male header, female header, and a jig to safely and secure attach them to your Pi Zero/Zero W and pHAT.

Assembling the acrylic pieces

You should have the following pieces:

- clear frosted front layer
- orange middle layer with antenna
- frosted orange back layer
- 2x orange leg retainers
- 2x orange legs with rubber feet attached
- 4x M3 white nylon bolts and nuts
- 2x M2.5 white nylon bolts and 4x nuts

Before you do anything, peel the protective film off all of the pieces of acrylic!

Take the clear frosted front layer with the etched side facing you and push through the four M3 bolts. Now flip it over face down, so that the long ends of the bolts are facing upwards.
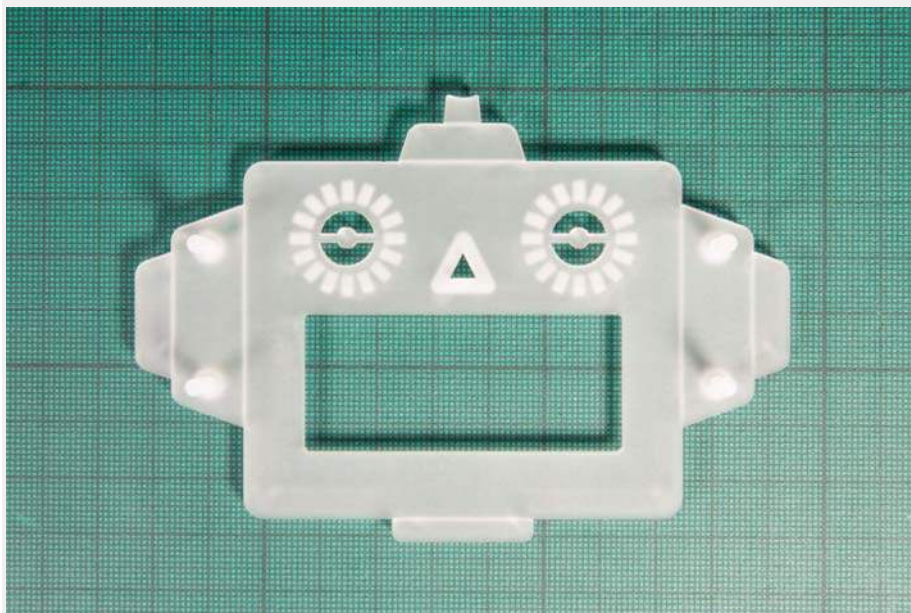
Next, take the middle orange layer and place it on top of the frosted front layer, sliding it down onto the four bolts.
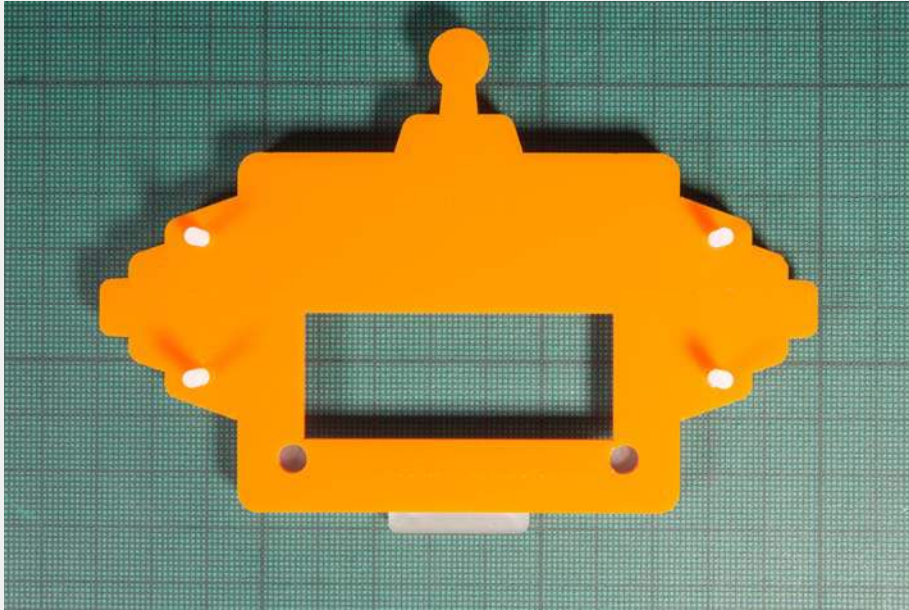
Attaching the Scroll pHAT HD

The frosted orange layer goes next. Your Scroll pHAT HD attaches to this layer using the two M2.5 bolts and the four M2.5 nuts. Because the LED pixels sit slightly proud of the board, we'll use the extra two nuts as spacers to sit it slightly off the frosted orange layer.
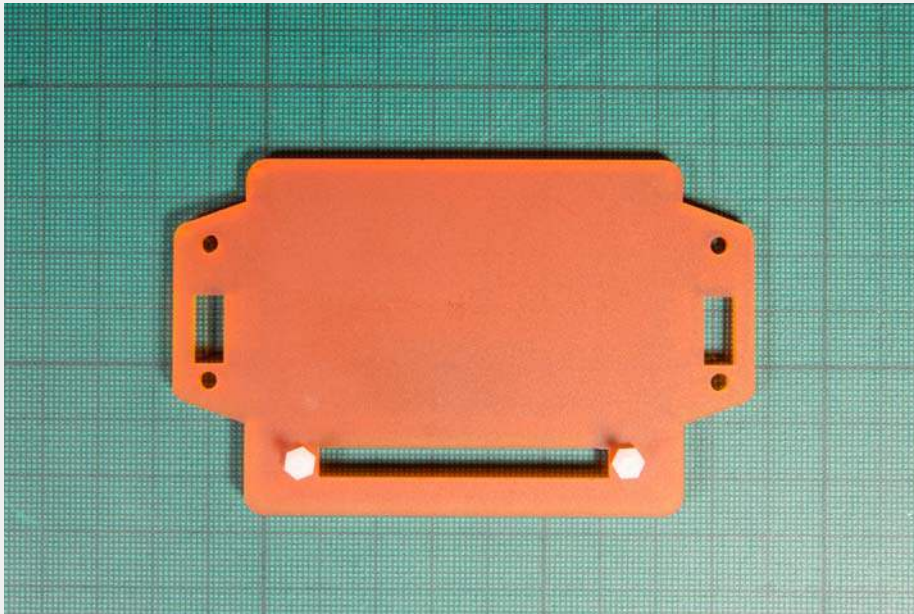
Push the two M2.5 bolts through the frosted orange layer and then screw two of the nuts on tight (these are the spacers). Now, slide your Scroll pHAT HD down onto the bolts, so that the LEDs are facing towards the acrylic. Use the remaining two nuts to secure the pHAT.


Note that the Scroll pHAT HD shown here is a prototype board in green, and the final production boards in the Scroll Bot kits are black.

Slide the frosted orange layer with Scroll pHAT HD attached on top of the other two layers.

Fitting the legs

We'll fit the legs now. Take the frosted orange leg retainers and turn them so that the rectangular cut-out is closest to the top. Take one of the legs and slot it through the rectangular slot in the retainer.
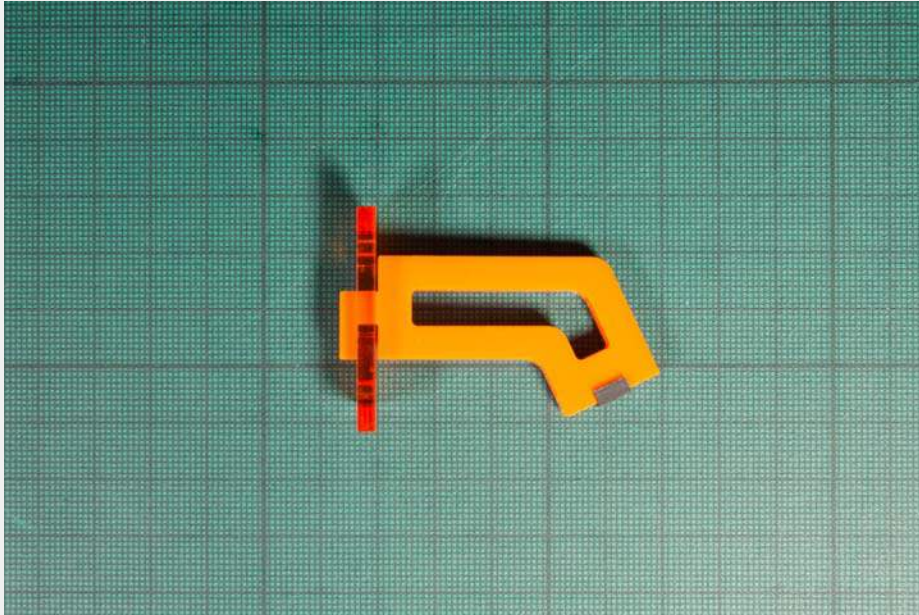

Place it into the recess on the back frosted orange layer, sliding it down over the two bolts. Do the same with the other leg, and then secure both with the M3 nuts.

Attaching your Pi Zero W

All that's left to do is to attach you Pi Zero W!

Take your Pi Zero W with soldered male header and pop it onto the female header on your Scroll pHAT HD, being careful to ensure that all of the pins are lined up correctly.
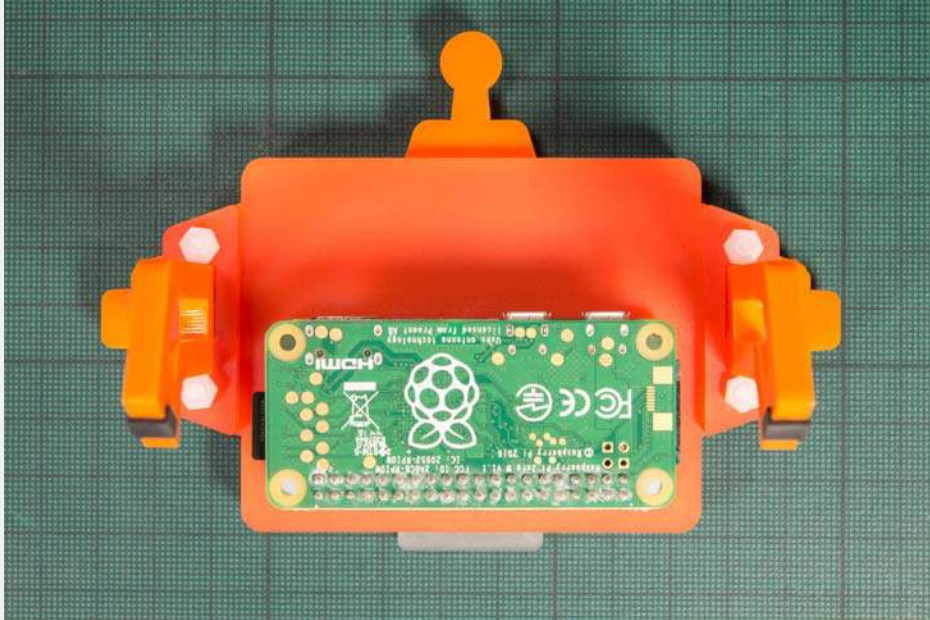
You can check out our Getting Started with Scroll pHAT HD guide to make sure that everything is working as it should, or check out our other Scroll Bot tutorials for more ideas.

Note that the default orientation for Scroll pHAT HD is upside-down if you're using it in a Scroll Bot. To flip it, simply add `scrollphathd.rotate(180)` towards the top of your code, just below the `import` lines.