

## PintSize Me LLC - Generator HATs/pHATs v2.6+

### Usage Notes:

HAT vs pHAT: HATs are for full size Pis (3, 4, 5); while pHATs are for the Pi Zero's (preferably the Zero 2). Matching the size is important so that the plug end can be stabilized to prevent short circuits on the barrel and Molex plugs. Failure to stabilize and leading to short circuits may destroy the controller on your generator.

If you saw one of the videos using a Pi Zero W, you can use a Pi 3, 4, or 5 and virtually nothing changes except the size of the device and potentially cooling needs if you are using a Pi 4 or 5.

Pre-loaded units have the GUI version of the Raspberry Pi OS loaded so that you can utilize the UI for configuring the device and is intended for a typical home-use scenario where you will be on the same network. It is not intended to be used as a desktop computer. GenMon is designed for you to use a browser on your computer (or tablet or phone), not from the Pi. If you have advanced needs such as remote viewing, you should investigate Tailscale or Ngrok; use a VPN to the site, or TeamViewer to a PC at the site and use a computer browser. There is nothing preventing the pre-loaded units from being used in a business or distributed scenario, but extra considerations such as security may need to be addressed to bring it in line with any standards or requirements the business may have.

### Configure:

- GENPWR – set ON if powering through the 8-wire Molex cable with the controller directly (may cause the controller to detect undervoltage) or if you are using the injector. Set OFF if you are powering with the barrel plug or by powering the Pi directly.
- BUCK – set ON if you are powering through the 8-wire Molex cable or with the 5.5mm barrel plug. Set OFF if you are powering from the Pi rather than the HAT.

### Features:

- Onboard power converter to drop the 12v available at the generator to the 5v needed to power the Pi and HAT. There is also a rectifier after the barrel plug to correct reversed connections.
- 5.5mm barrel plug that can be used to power the Pi and HAT from the generator battery.
- 8-pin Molex connector to provide data connectivity with the generator controller, also can provide power with Evolution2/Sync3 controllers or when used with the Injector. Power from the Evolution2/Sync3 controller is quite limited and if your Pi pulls too much power it will falsely trigger a utility under-voltage situation causing your generator to start and transfer. If this happens disconnect immediately and provide power through another method.
- Tri-color LED connected to GPIO23 (green), GPIO24 (red), and GPIO07 (blue) which line up with default outputs for ready, running, and alert when using "GenMon GPIO Outputs".

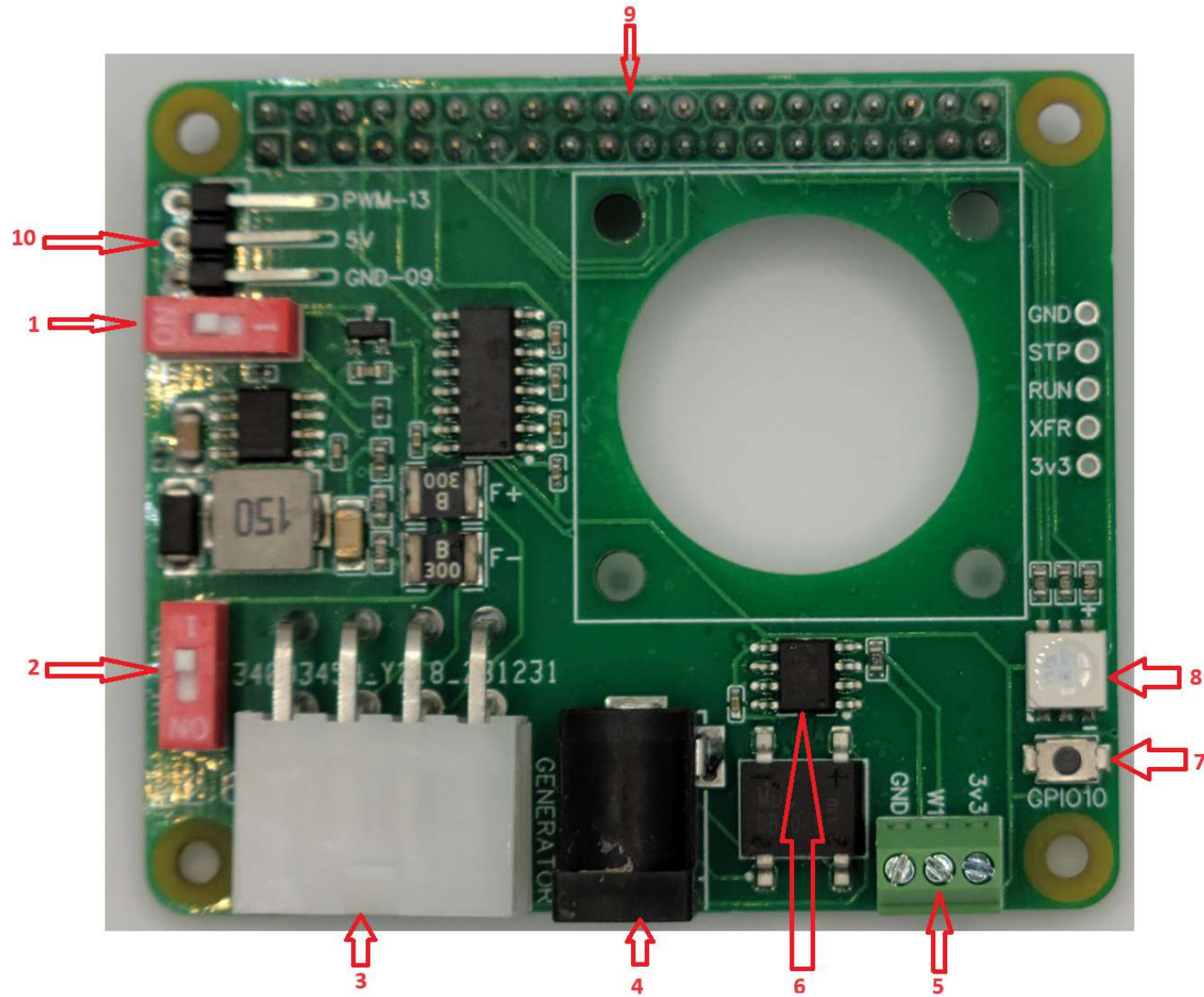
- Momentary pushbutton connected to GPIO10, there is no built in function for this button.
- A DS18B20 1-wire temperature sensor chip is on board connected to GPIO04 and a 3-position screw terminal for additional external 1-Wire sensors.
- On HATs, there is also a 3-pin fan header with ground controlled via GPIO09 (compatible with the Raspberry Pi fan control in raspi-config). Set the pin to HIGH to turn the fan on and LOW to turn the fan off. The third pin is a PWM pin tied to GPIO13 for advanced fan uses, while we have made the pin available we do not have any scripts for utilizing it. If you do this, you will also want to set GPIO09 to default to a high state in config.txt so that the pin controlling the fan ground is set to the ON state ([https://www.raspberrypi.com/documentation/computers/config\\_txt.html#gpio](https://www.raspberrypi.com/documentation/computers/config_txt.html#gpio)).

### Installing the HAT:

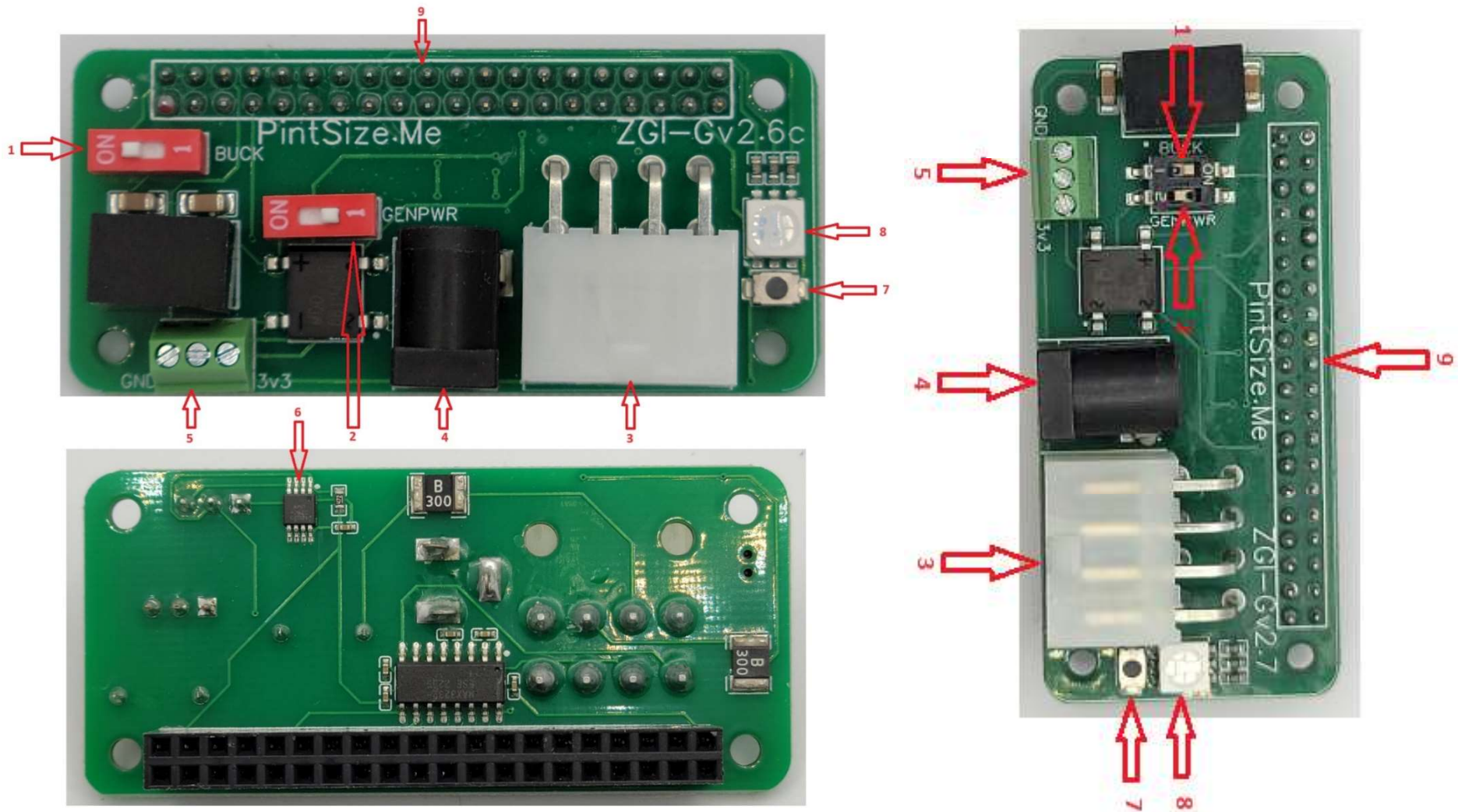
- HAT/pHAT only installs:
  - Prepare the micro-SD card with Raspberry Pi OS
  - Heatsinks on the Pi CPU are recommended
  - Prepare the Pi with standoffs on the edge with the HDMI plugs
  - Attach the HAT to the 40-pin header and seated on the standoffs on the opposite edge
  - Secure the HAT to the standoffs on the
  - Install GenMon
  - Optionally install the PintSizeFanService if you are using a fan on the HAT
  - Go to “All Installs” below.
- Preloaded installs: (full units or micro-SD)
  - OS Login: username: “genmonpi”, password: “raspberrypi”, machine name: “genmon”. Change the password.
  - GenMon Login: username: “genadmin”, password “raspberrypi”. Change the password in GenMon on the settings page.
  - Option 1 (recommended): Connect a display, keyboard, and mouse, use the OS UI to configure the WiFi credentials.
  - Option 2 (may work, but do not count on this yet, there are no real troubleshooting options on this path without connecting a display, keyboard, and mouse):
    - Boot up the Pi, then press and hold the button on the HAT. It will first turn red, then after 5 seconds it will turn white, this indicates the captive portal is loading.
      - Connect your device to the “config” hotspot with a password of “genmon00” (that is 2 zeros).
      - Open <http://genmon/> or <http://10.42.0.1> – some devices may take up to 2 minutes to fully connect as many devices do not like hotspots without internet access.
      - When the portal loads:
        - Select your timezone and save timezone

- Select your WiFi's name and enter the password, and then click the save button under WiFi. This will shut off the portal and connect the Pi to your wifi. Once your device is reconnected to your WiFi you can reconnect to the portal if you wish, or proceed with other steps.
- If you use the UPDATE function in the portal, it only updates the PintSize resources (fan manager, and the portal), and updating it will shut down the portal.
- A triple press of the button on the HAT will activate the portal without the hotspot. This is useful if you are already connected to WiFi but need to update the PintSize.Me software or use the configuration tools. After a successful triple-press the LED will turn green.
- Access GenMon at <http://genmon:8000/>, <http://genmon.local:8000/> or if you have the IP address <http://{ip}:8000/>.
- Go to "All Installs" below.
- All installs:
  - Set the switches for your needs, see the CONFIGURE section at the top of this document.
  - Setup place everything into your enclosure (probably something plastic to protect from short circuits and if outside to protect from the elements and run cables through the appropriate holes.
  - If powering by the battery, connect battery to barrel plug
  - Connect the Molex cable to the HAT and then to the controller

HAT – v2.6 pictured, different from previous layouts

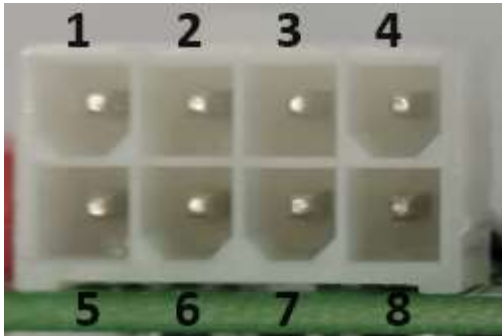


pHAT – v2.6 and v2.7 pictured, different from previous layouts. The bottom of 2.6 and 2.7 is the same.



1. BUCK switch
2. GENPWR switch
3. Molex plug
4. Barrel plug
5. 1-Wire screw terminals
6. On-board DS18B20 temperature sensor
7. Button
8. Tri-Color LED
9. 40-pin header
10. Fan pins

Molex plug



1. RS485 Receive – not connected
2. RS485 Transmit – not connected
3. Generator Receive – Pi Transmit
4. Generator Transmit – Pi Receive
5. 5v – not connected
6. Ground – goes to a fuse, and then ground on the board and Pi
7. 12v – goes to a fuse, GENPWR switch, finally to buck circuit
8. Ground – secondary ground, flakey on some controllers, not connected

Barrel plug



1. Goes to a rectifier for reverse polarity protection – center can be positive or negative, but recommend positive so the outside of the barrel touches anything it will be ground to ground.
2. Joins the Molex 12v power after the fuse and GENPWR switch, goes to the buck circuit