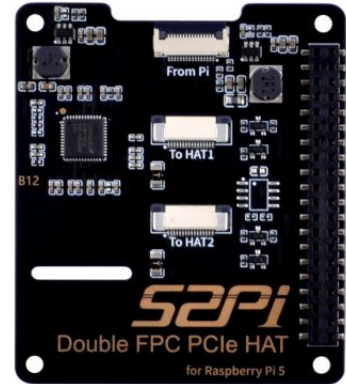


EP-0230

B12 RPi 5 Double FPC PCIe HAT

Description

Introducing B12 Raspberry Pi HAT: Expand Your PCIe Connectivity Elevate your Raspberry Pi 5 experience with the B12 Raspberry Pi HAT, a versatile accessory that transforms your FPC PCIe interface into two, enabling seamless connection to multiple PCIe devices. With the ability to daisy-chain multiple B12 units, users can create a multi-level PCIe setup for enhanced flexibility and functionality. Explore the standout features of the B12 below:

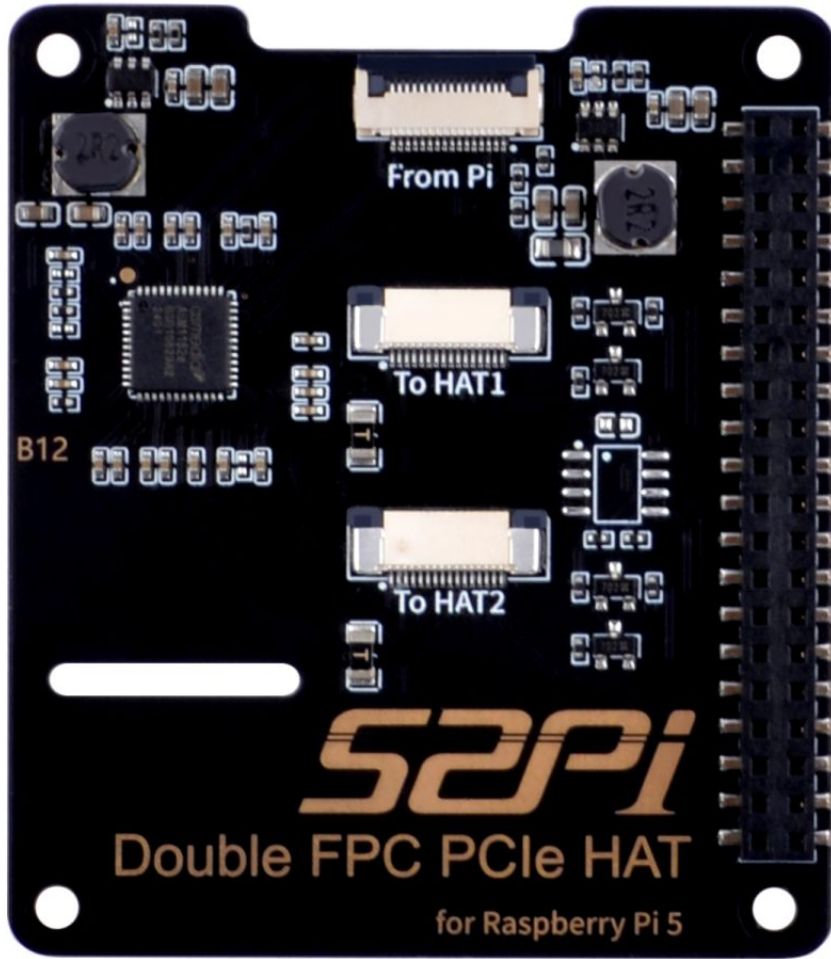


Features

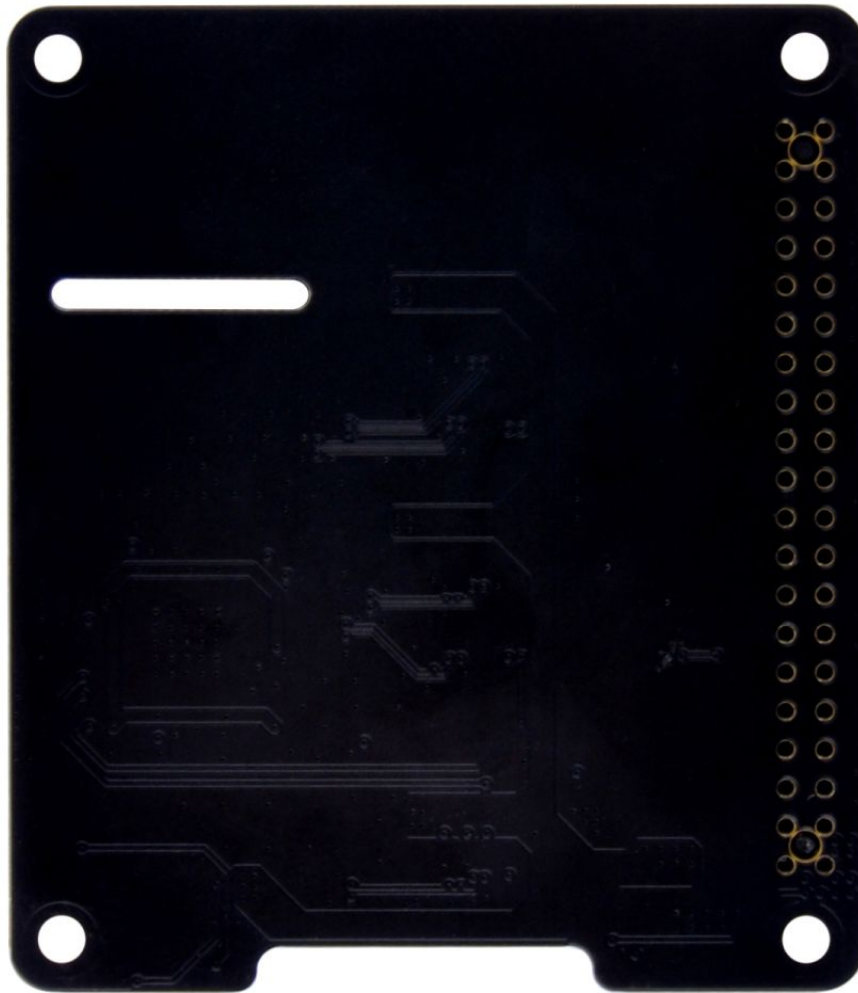
- **Dual PCIe Expansion:** Effortlessly expand your Raspberry Pi 5's FPC PCIe interface into two, providing users with the convenience of connecting multiple PCIe devices simultaneously for increased productivity and versatility.
- **Daisy-Chaining Capability:** Connect multiple B12 units in a cascading fashion to create a multi-tiered PCIe configuration, allowing for expanded connectivity options and customized setups tailored to your specific needs.
- **Seamless Integration:** Designed for easy integration, the B12 Raspberry Pi HAT offers a user-friendly experience, making it simple to set up and configure for immediate use with your Raspberry Pi 5.
- **Enhanced Connectivity:** Unlock the potential to connect a wide range of PCIe devices, such as SSDs, GPUs, network cards, and more, expanding the capabilities of your Raspberry Pi 5 for diverse applications and projects.
- **Robust and Reliable Design:** Built with quality and durability in mind, the B12 Raspberry Pi HAT ensures stable and reliable performance, providing a dependable solution for your PCIe expansion needs.
- **Transform your Raspberry Pi 5 into a powerhouse of connectivity with the B12 Raspberry Pi HAT.** Experience seamless PCIe expansion, enhanced flexibility, and endless possibilities for your projects and applications. Elevate your setup with the B12 and unleash the full potential of your Raspberry Pi 5.
- **Dual Board Expansion:** This feature allows for the connection of two additional Pineberry Pi boards, providing users with the flexibility to expand their projects' scope and functionality.
- **ASMedia PCIe Switch Integration:** The board incorporates an ASMedia PCIe Switch (Gen2 variant), facilitating reliable and efficient data transfer between connected devices.
- **Included FPC Ribbon Cables:** Three FPC ribbon cables are provided, simplifying the connection process and offering flexibility in setup and configuration.
- **Compatible Form Factor:** Board format is compatible with the original Raspberry Pi HAT dimensions of 65 x 56.50 mm.
- **40-Pin Raspberry Pi HAT Connector Support:** Supports the standard 40-pin Raspberry Pi HAT connector.

Gallery

- Product Outlook

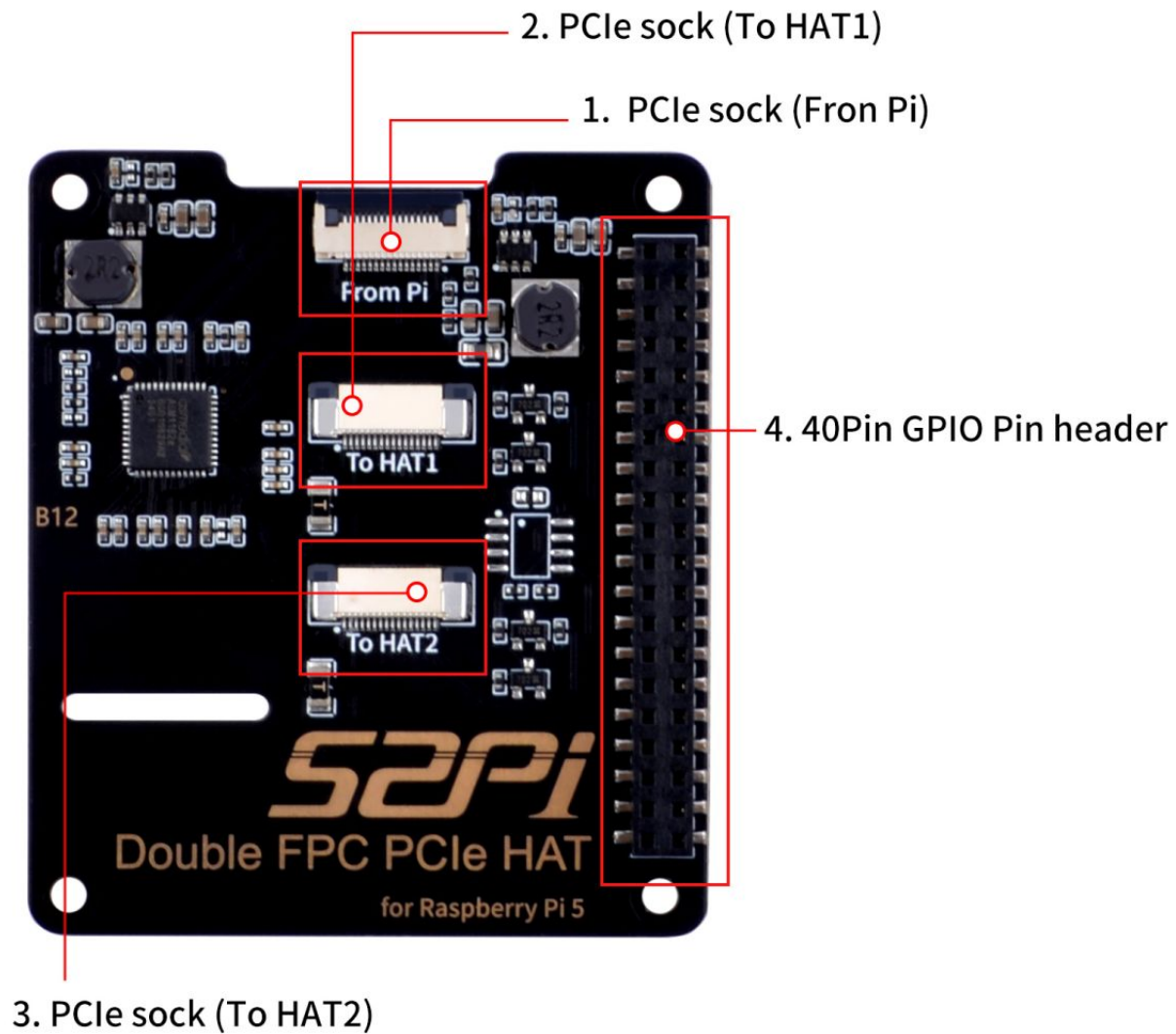


- Back face

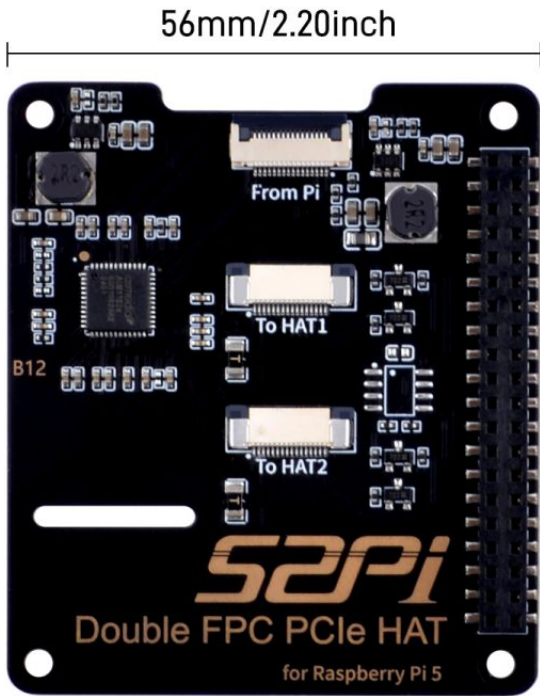


- What's on board

What's On Board

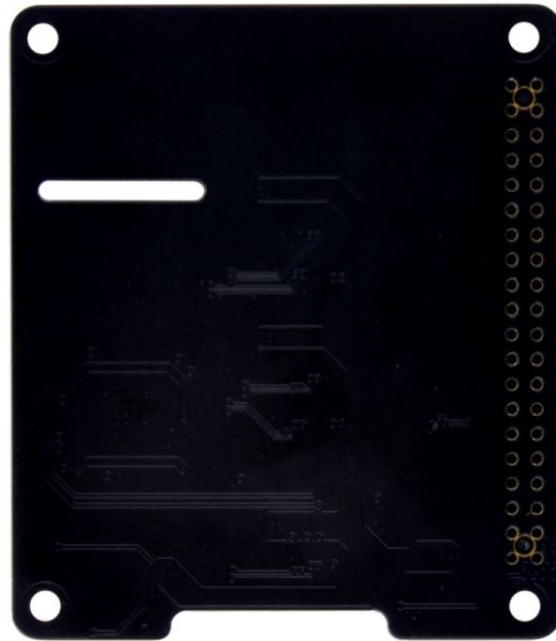


- Product Dimension



56mm/2.20inch

65mm/2.56inch



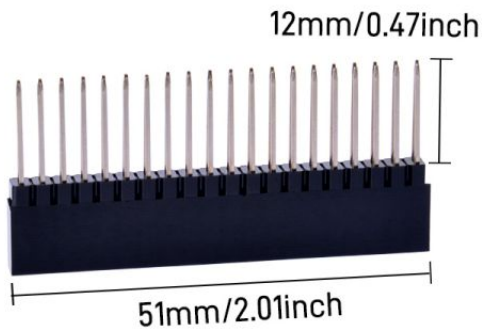
40mm/1.57inch

8.5mm/0.33inch



60mm/2.36inch

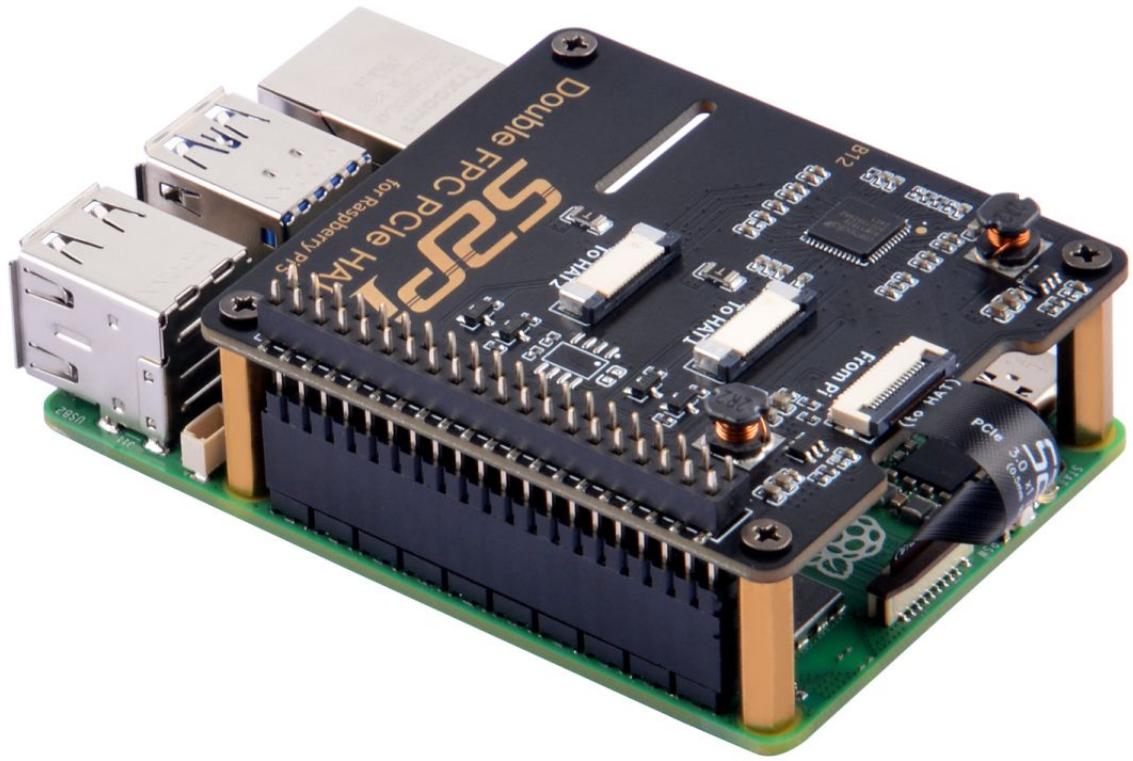
8.5mm/0.33inch



12mm/0.47inch

51mm/2.01inch

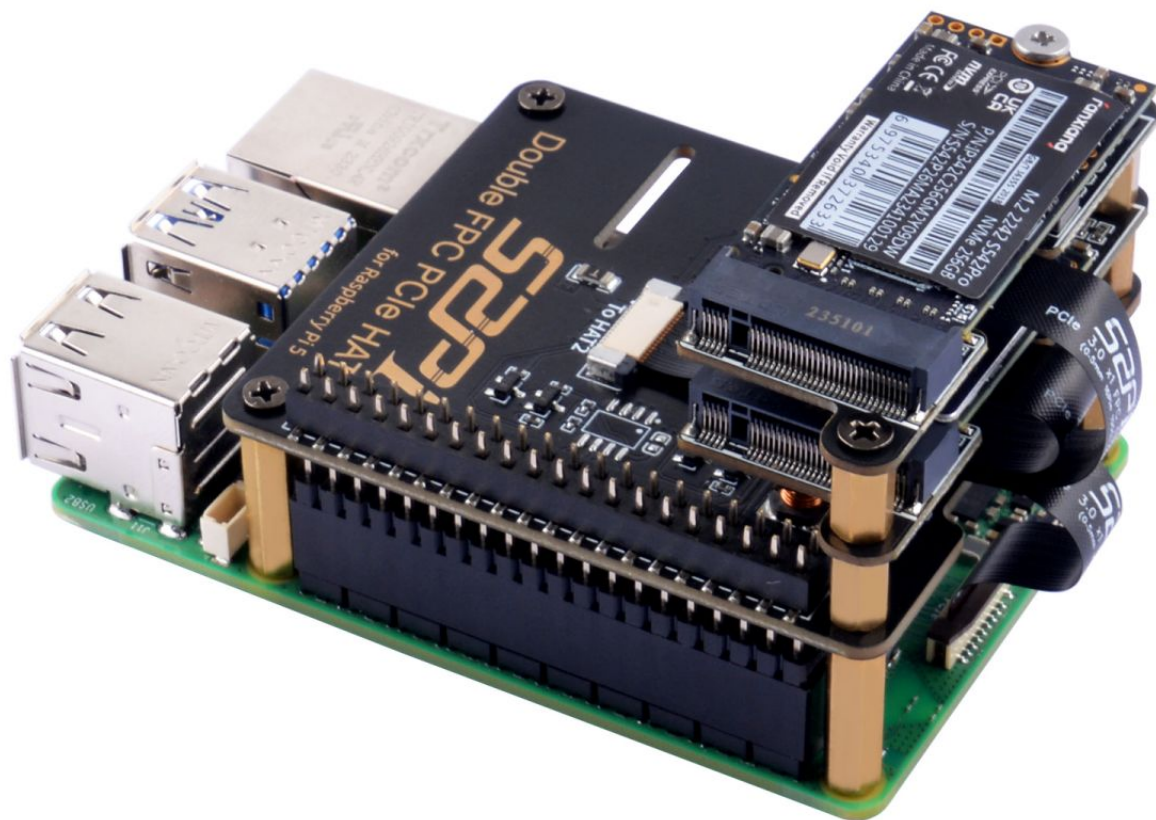
- Application scenario



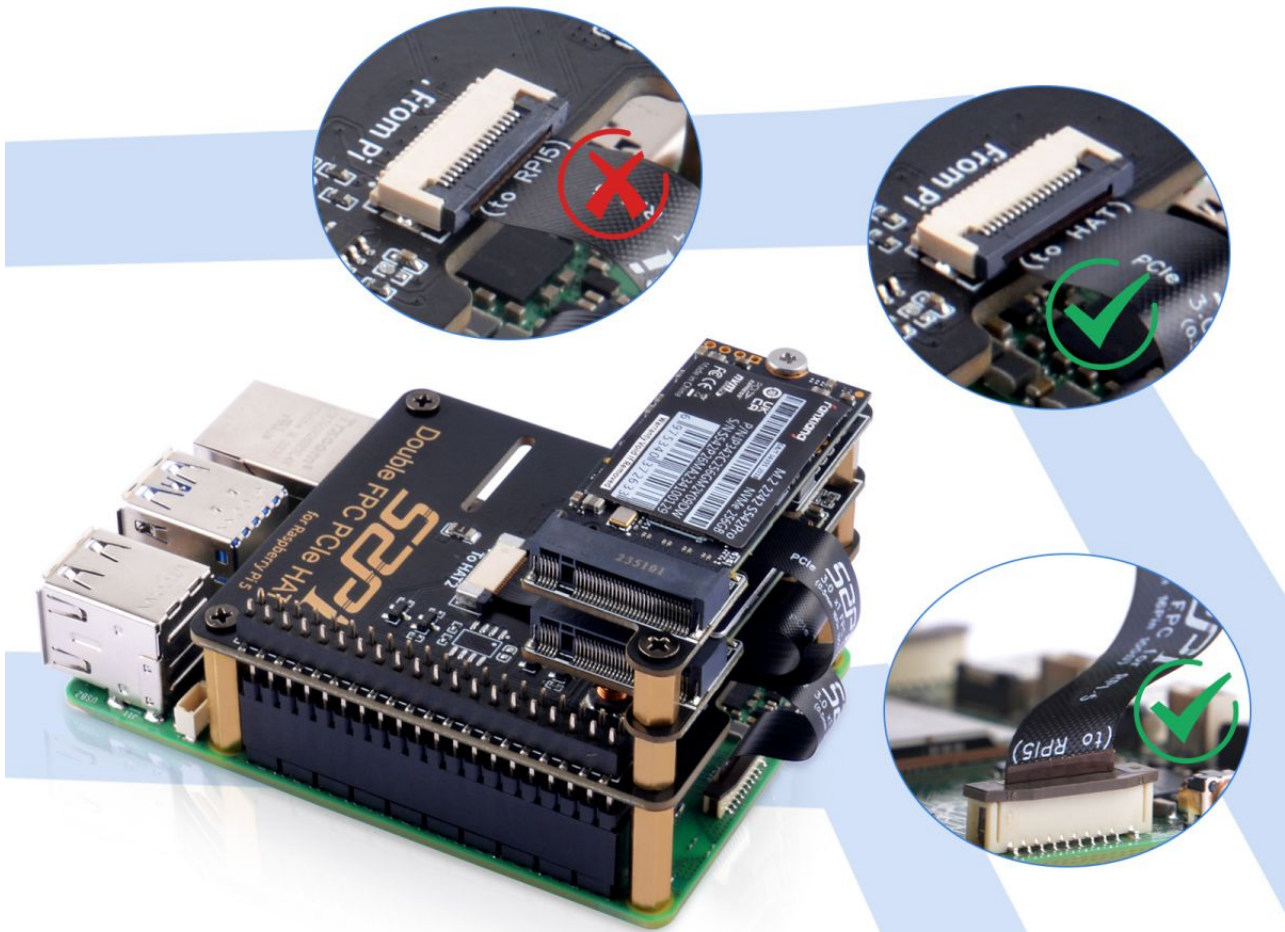
Designed for RPi 5

Dedicated to the latest single-board computer, the Raspberry Pi 5.



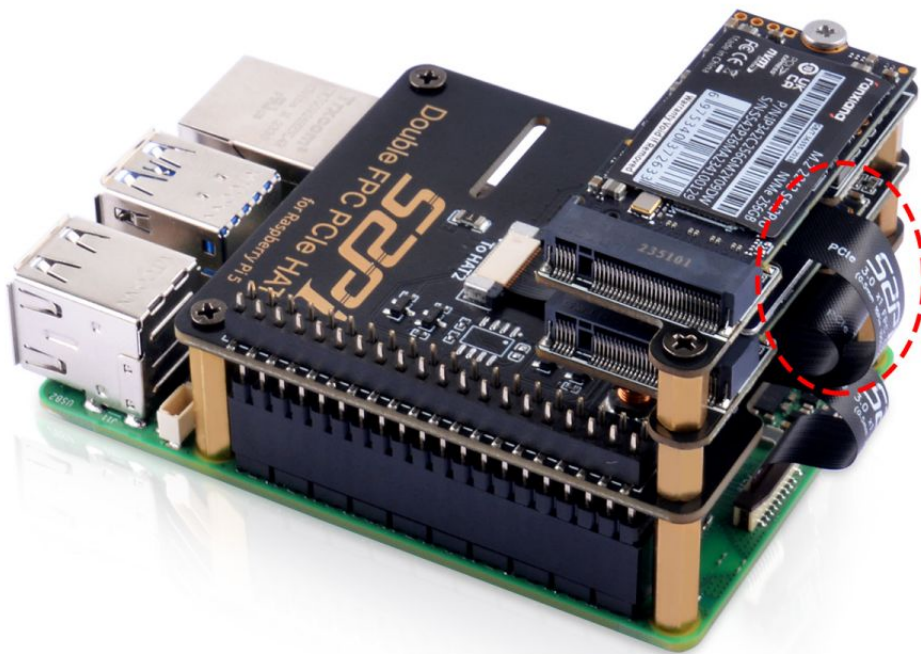
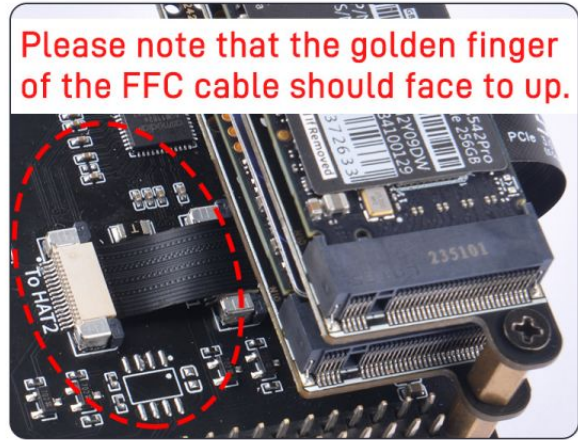
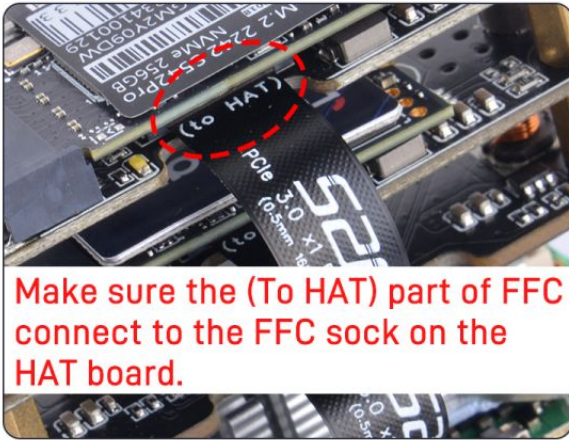


- FFC connection details



Raspberry Pi 5 and M.2 NVMe SSD drives do not include in the package, additional purchase required!

- Connection details

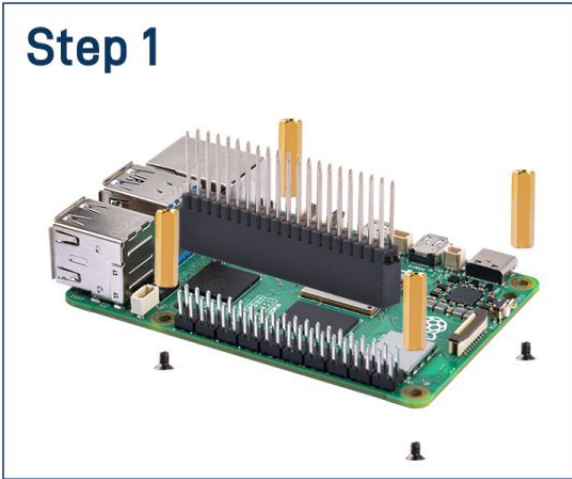


How to assemble it?

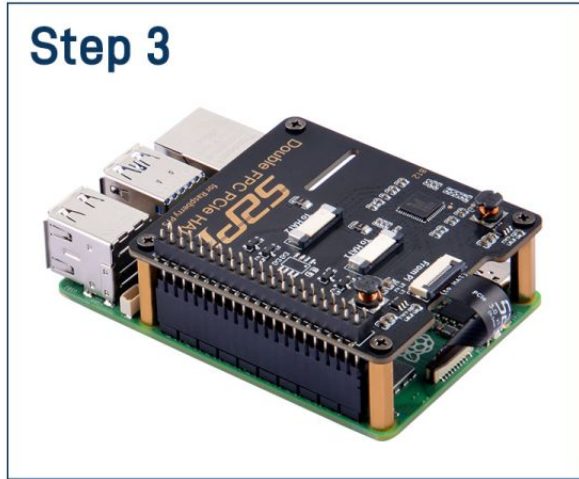
- Please assemble it according to following figure.

INSTALLATION STEPS

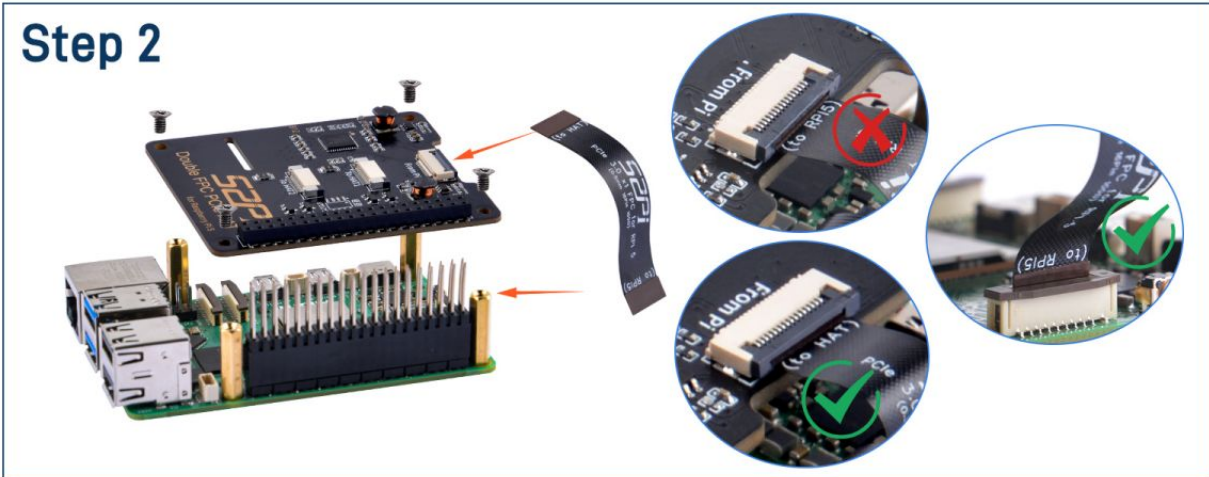
Step 1



Step 3



Step 2

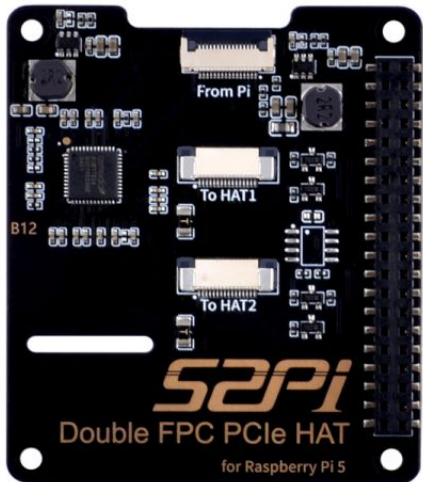


NOTE: Raspberry Pi 5 does not include in the package, additional purchase required.

Package Includes

- 1 x Double FPC PCIe HAT
- 8 x M2.5*4mm Flat head screw
- 4 x M2.5*17mm Copper pillar
- 2 x 8.5*40mm PCIe FFC cable
- 2 x 8.5*60mm PCIe FFC cable
- 1 x M2.5 screw driver

PACKAGE INCLUDES



1 x Double FPC PCIe HAT



8 x M2.5*4mm Flat head screw



4 x M2.5*17mm Copper pillar



2 x 8.5*40mm PCIe FFC cable



2 x 8.5*60mm PCIe FFC cable



1 x 40Pin PC104 Pin Header
1 x M2.5 Screw driver

How to enable PCIe on Raspberry Pi 5?

- We assume that you are using Raspberry Pi OS (bookworm) 2024-03-15

Step 1

- Enable PCIe function

Edit `/boot/firmware/config.txt` file and adding following parameter in to the file.

```
dtparam=pciex1  
dtparam=pciex1_gen=3
```

Save it and then do remember reboot your Raspberry Pi to take effect.

Step 2

```
pi@raspberrypi: ~
File Edit Tabs Help
arm_64bit=1

# Disable compensation for displays with overscan
disable_overscan=1

# Run as fast as firmware / board allows
arm_boost=1

[cm4]
# Enable host mode on the 2711 built-in XHCI USB controller.
# This line should be removed if the legacy DWC2 controller is required
# (e.g. for USB device mode) or if USB support is not required.
otg_mode=1

[all]
dtparam=pciex1
dtparam=pciex1_gen=3
pi@raspberrypi:~$
pi@raspberrypi:~$
```

Check if the SSD drive has been

recognized

```
sudo lspci
```

Result be like:

```
pi@rpi5-86:~$ sudo lspci
0000:00:00.0 PCI bridge: Broadcom Inc. and subsidiaries Device 2712 (rev 21)
0000:01:00.0 PCI bridge: ASMedia Technology Inc. ASM1182e 2-Port PCIe x1 Gen2 Packet Switch
0000:02:03.0 PCI bridge: ASMedia Technology Inc. ASM1182e 2-Port PCIe x1 Gen2 Packet Switch
0000:02:07.0 PCI bridge: ASMedia Technology Inc. ASM1182e 2-Port PCIe x1 Gen2 Packet Switch
0000:03:00.0 Non-Volatile memory controller: MAXIO Technology (Hangzhou) Ltd. NVMe SSD Controller MAP1202 (rev 01)
0000:04:00.0 Non-Volatile memory controller: MAXIO Technology (Hangzhou) Ltd. NVMe SSD Controller MAP1202 (rev 01)
0001:00:00.0 PCI bridge: Broadcom Inc. and subsidiaries Device 2712 (rev 21)
0001:01:00.0 Ethernet controller: Device 1de4:0001
pi@rpi5-86:~$
```

Keywords

- B12 RPi 5 Double FPC PCIe HAT, Expand PCIe slot board for Raspberry Pi 5.

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