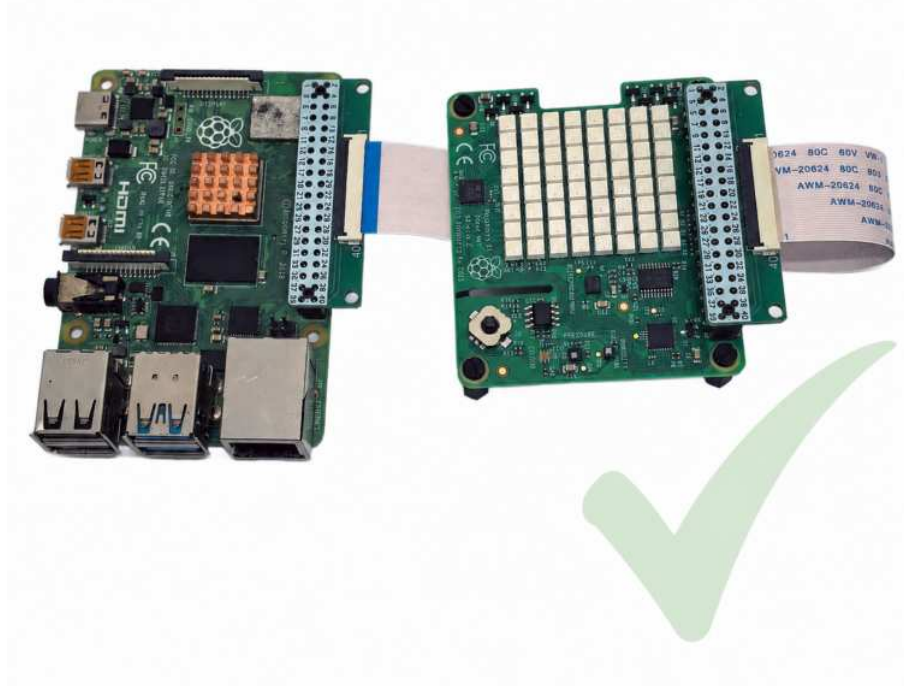


G40-F05PT-K2

FPC to GPIO Adapter Connection Guide

For Raspberry Pi GPIO to remote HAT connection

Correct Connection



Example of a correct Raspberry Pi to HAT connection.

This guide explains the correct cable orientation, correct and incorrect installation examples, power and load considerations, and the basic checks that should be made before powering the system.

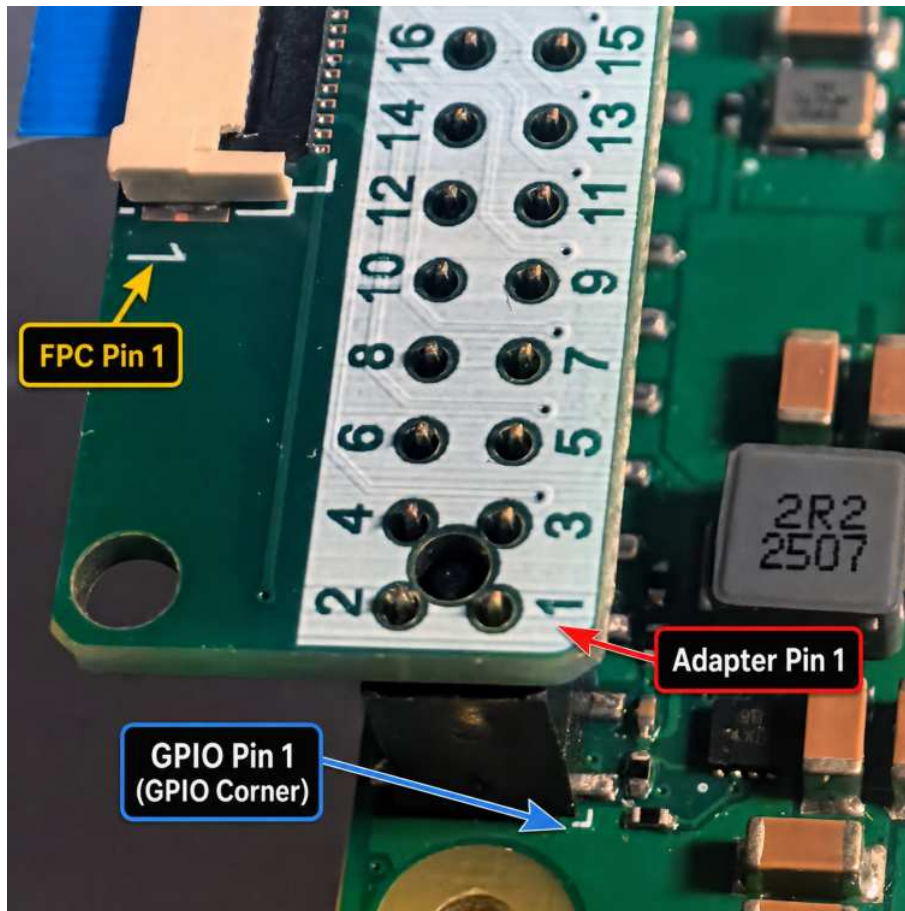
1. Product Overview

This adapter kit extends the Raspberry Pi 40-pin GPIO header through a 0.5mm pitch FPC cable. It is intended for remote HAT mounting, space-saving installations, and custom stacking layouts.

- Two GPIO-to-FPC adapter boards are used: one at the Raspberry Pi side and one at the HAT side.
- The kit is normally supplied with the 15cm FPC cable already pre-connected in the correct orientation.
- The FPC connectors support the cable from either side, so the visible printed side of the cable is not a reliable installation reference by itself.
- A 25cm FPC cable may also be used, but it must be installed in exactly the same Pin 1 orientation as the pre-connected 15cm cable.

2. Identify Pin 1 Before Installation

Always begin by identifying Pin 1 on the Raspberry Pi / HAT GPIO header, Pin 1 on the adapter board, and Pin 1 marking near the FPC connector.



Pin 1 reference points: GPIO Pin 1 corner on the host board, adapter Pin 1 marking, and FPC Pin 1 marking.

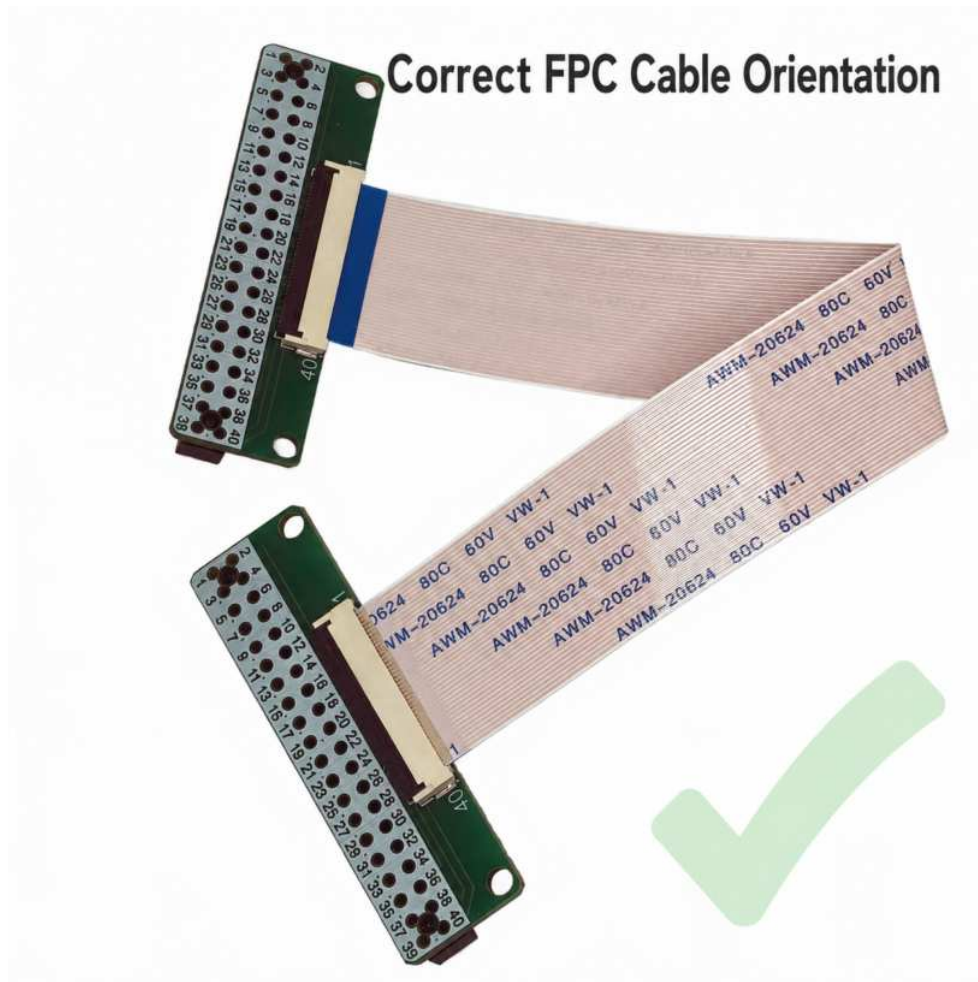
- GPIO Pin 1 is the corner position on the Raspberry Pi or HAT GPIO header.
- Adapter Pin 1 is the printed “1” position on the adapter board.
- FPC Pin 1 is the printed Pin 1 indicator beside the FPC connector on the adapter.

3. Important FPC Cable Orientation

The two adapters are supplied pre-connected with the 15cm FPC cable in the correct orientation. Before installation, make sure the physical GPIO numbering remains matched 1:1 from the Raspberry Pi to the adapter and then to the HAT.

- Raspberry Pi physical GPIO Pin 1 must correspond to adapter Pin 1.
- HAT physical GPIO Pin 1 must correspond to adapter Pin 1.
- All 40 physical GPIO pins must remain directly matched 1:1.
- The same edge conductor of the FPC cable must connect to Pin 1 at both adapter boards.

Because the FPC connectors support the cable from either side, a correct installation may show the printed side of the cable at one end and the reverse side at the other end. This is normal. Do not determine the connection direction only by which side of the cable printing is visible.

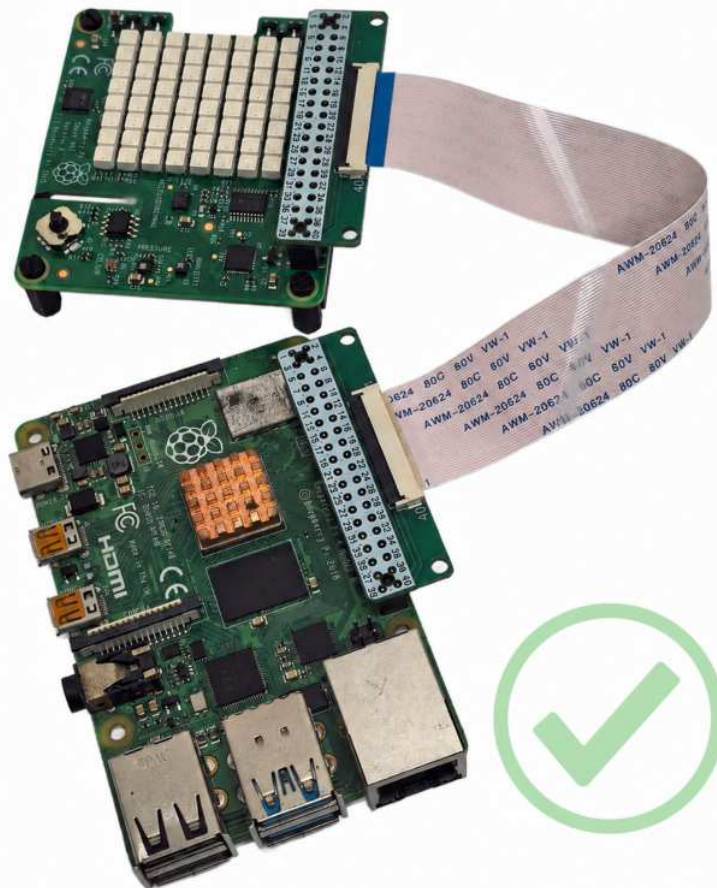


Correct FPC cable orientation between the two adapter boards.

4. Correct Installation Examples

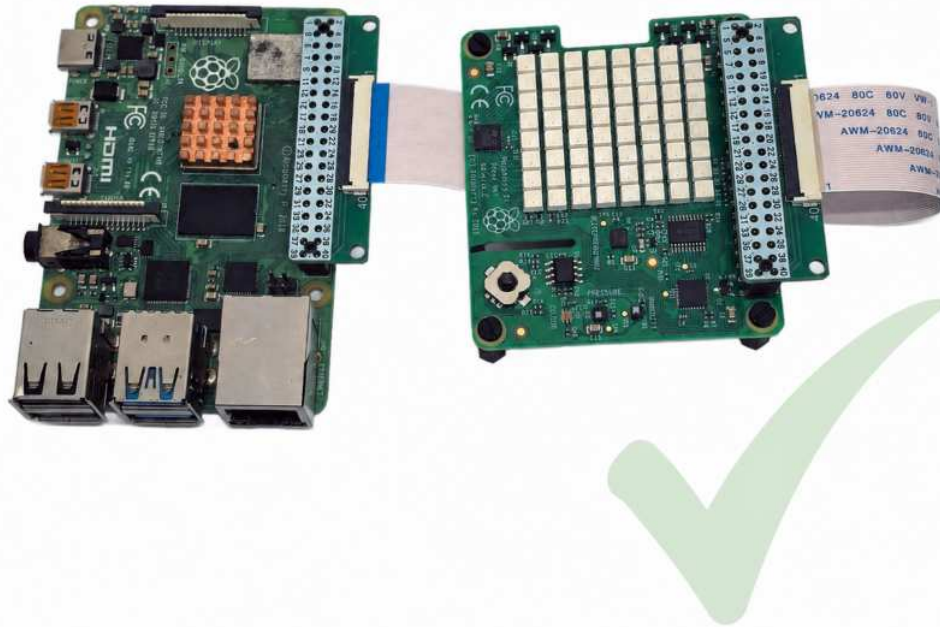
The following examples show correct GPIO-to-HAT extension layouts. In these examples, the adapter pin numbering remains aligned to GPIO Pin 1 and the FPC cable orientation is also correct.

Correct Connection



Correct connection example.

Correct Connection



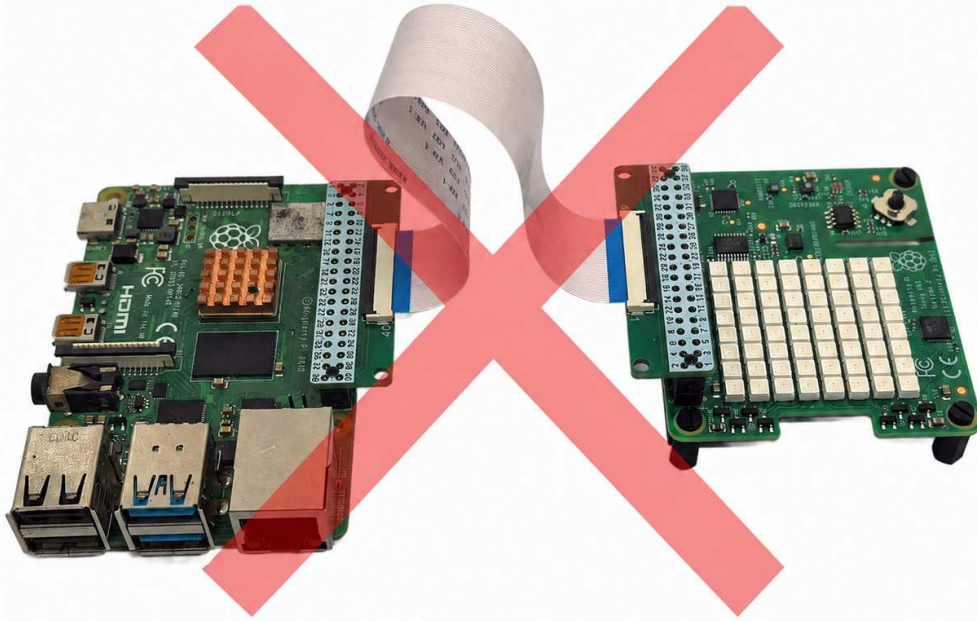
Another correct connection example.

5. Incorrect and Not Recommended Examples

The following examples must not be treated as normal installation references.

Incorrect FPC Orientation

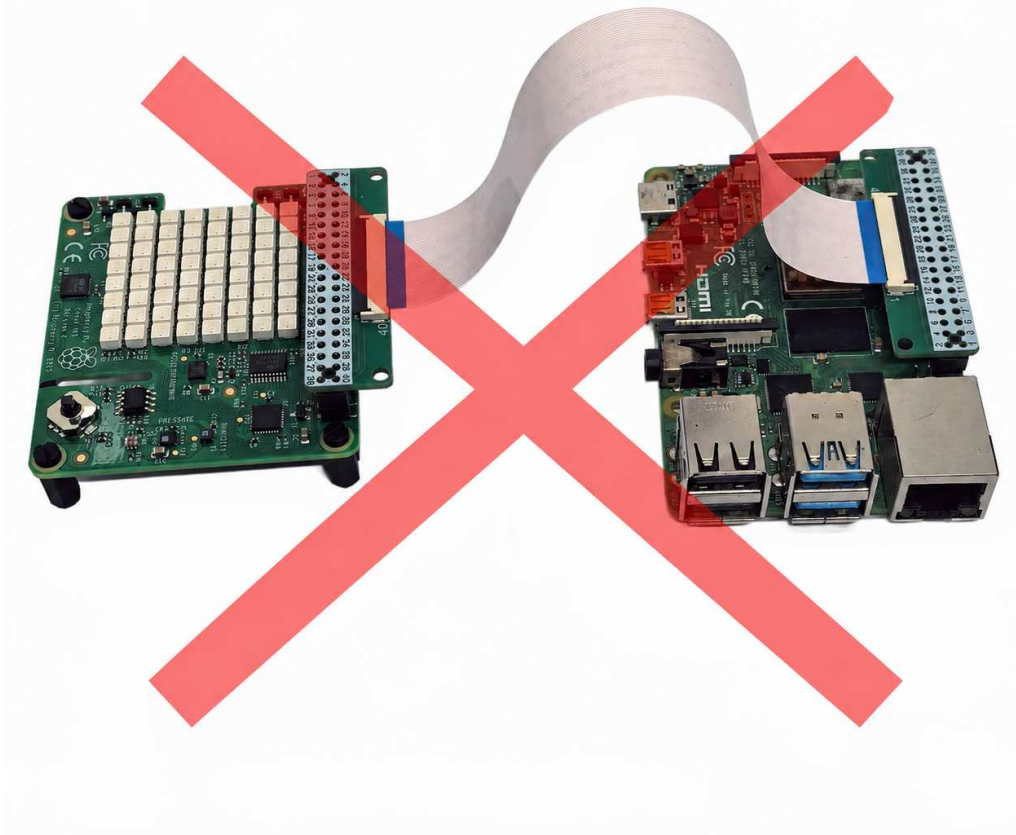
Adapter aligned to Pin 1, but
FPC cable orientation is incorrect.



Wrong connection: the adapter is aligned to Pin 1, but the FPC cable orientation is incorrect.

Not Recommended

Electrically correct, but the adapter is not aligned to GPIO Pin 1.



Not recommended: electrically correct, but the adapter is not aligned to GPIO Pin 1. Avoid this connection method.

6. Replacing the 15cm Cable

If you replace the supplied 15cm cable with the supplied 25cm cable, keep exactly the same orientation as the original cable.

- Observe the original 15cm cable orientation before removal.
- Install the 25cm cable in exactly the same Pin 1 orientation.
- Confirm that adapter Pin 1 still corresponds to GPIO Pin 1 at both ends.
- Never power the Raspberry Pi if the 40-pin numbering does not match 1:1 at both ends.

7. Power and Load Notes

The FPC link is designed primarily for GPIO extension and normal HAT power requirements, not as a high-current power cable.

- The FPC cable specification states up to 0.5A per conductor.
- The Raspberry Pi 40-pin GPIO header provides 5V on physical Pin 2 and Pin 4, so two conductors are available for the main 5V path.
- For practical use, connector resistance, cable length, current sharing, and voltage drop must all be considered.
- For the 15cm cable, around 0.8A total continuous 5V load is a reasonable conservative target for normal use.
- Around 1A total should be treated as an upper-region condition rather than a guaranteed continuous operating current.
- The 25cm cable should be used with lower sustained current whenever possible to reduce voltage drop.

- High-current HATs or accessories should use separate power where practical.

8. Multiple HATs and Resource Compatibility

The adapter extends all 40 GPIO pins electrically, but not every combination of HATs can operate together.

- Check GPIO resource usage before connecting multiple HATs.
- Possible conflicts include SPI, UART, PWM, PCM/I2S, dedicated GPIO control lines, and I2C address overlap.
- M.2 HAT+ and AI HAT+ generally rely less on the classic SPI/UART/PWM GPIO functions than many conventional HATs, but mechanical clearance and total power must still be checked.
- PoE HATs mainly use the dedicated PoE header for power, but height, clearance, and total load must still be verified.

If using two or more kits for multiple remote HATs, branch each HAT directly from the Raspberry Pi side whenever possible instead of daisy-chaining one HAT through another. This helps reduce cable loading and voltage drop.

9. Raspberry Pi 5 Active Cooler and PoE Notes

- If a Raspberry Pi 5 Active Cooler blocks the mounting height, use the supplied long-pin stacking header (if included with your kit) to raise the adapter above the cooler.
- If a PoE HAT is raised above its normal position, use the supplied 4-pin PoE header risers as needed to match the GPIO stacking height.
- Keep the main PoE power path through the normal Raspberry Pi / PoE header arrangement rather than trying to route full PoE power through the FPC cable.

10. Quick Check Before Power-On

Before applying power, quickly confirm the following:

- GPIO Pin 1 matches adapter Pin 1 at the Raspberry Pi side.
- GPIO Pin 1 matches adapter Pin 1 at the HAT side.
- All 40 GPIO pins remain aligned 1:1.
- Both FPC locking tabs are fully closed.
- No board has been shifted sideways by one pin or one row.
- Total connected load is within the capability of the power supply and FPC connection.
- If anything is uncertain, use a multimeter before power-on to verify that Pin 1↔Pin 1, Pin 2↔Pin 2, Pin 39↔Pin 39, and Pin 40↔Pin 40 correspond correctly between the two adapter ends.

If the connection direction is uncertain, disconnect power and compare the installation with the diagrams in this guide before continuing.

Note: Raspberry Pi boards, HATs, relay boards, acrylic brackets, and other demonstration accessories shown in product photos are not included unless explicitly listed in the product package contents.