



For Raspberry Pi® - Getting started

Extend your PiFace™ Relay+ with the PiFace™ Relay EXTRA board, allowing you to control twice as many circuits.

Product highlights

Typical applications:

- Robotics
- Motor control
- Home automation

Features:

- 4 onboard relays
- 4 indicator LEDs
- 4 GPIO
- Easy to use software
- Easy connection with screw terminals
- Compact size
- Raspberry Pi® HAT footprint when used with PiFace™ Relay+
- Can be used directly in breadboards, prototyping and custom designs

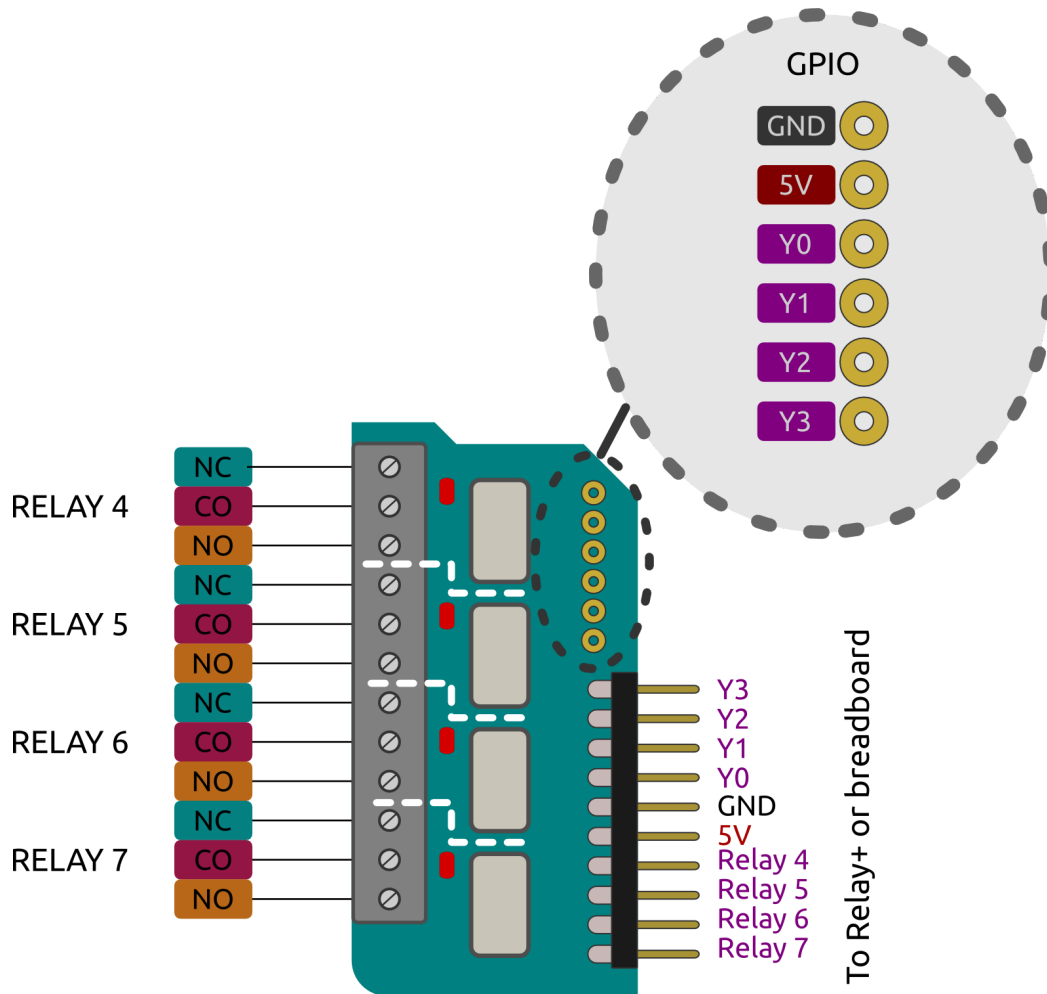
Technical specifications:

- 4 changeover relays, 20V 1A switching max
- 4 GPIO
- Standard 0.1" pin spacing (breadboard & veroboard compatible)

PiFace™ Relay+ is a highly expandable interface board for Raspberry Pi® with easy to connect screw terminals. A range of pick and mix EXTRA boards allow you to further expand the capabilities. If you need even more connectivity, up to eight PiFace™ Relay+ boards can be stacked on a single Raspberry Pi®. As PiFace™ Relay+ is HAT compatible, the stack fits perfectly on the Raspberry Pi® A+ and B+ models.

PiFace™ Relay EXTRA plugs into the EXTRA port on PiFace™ Relay+ and is controlled by the same library and command structure. Alternatively you can plug PiFace™ Relay EXTRA straight into a breadboard and control the relays directly.

Tour of hardware



Before using PiFace™ Relay+ or any PiFace™ EXTRA board always read the instructions and precautions carefully.

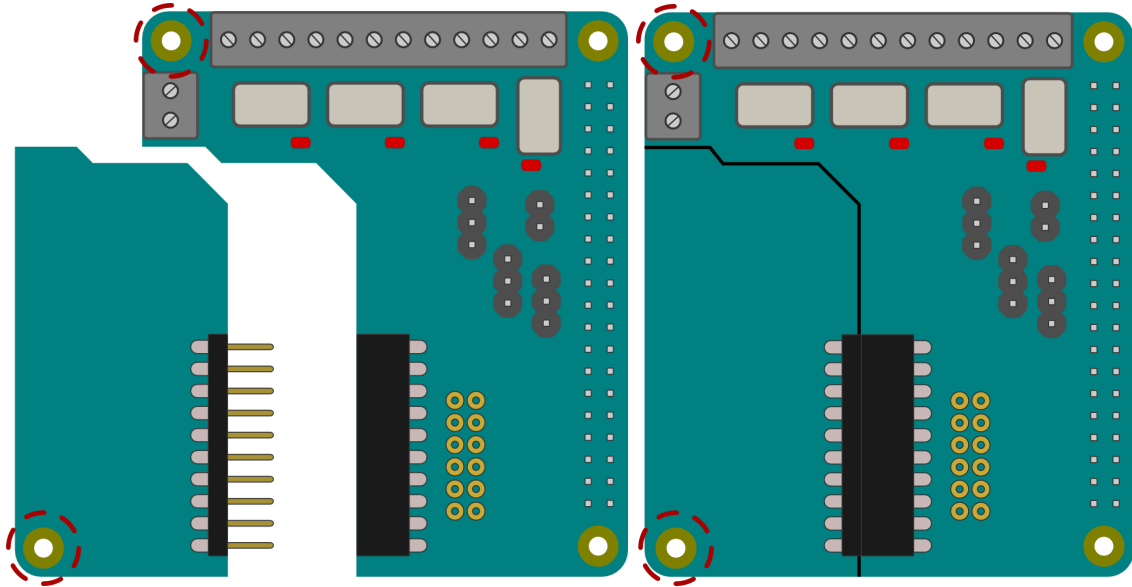
Fitting instructions

Warnings

- Ensure that no power is supplied to Raspberry Pi®, PiFace™ Relay+ or PiFace™ EXTRA boards when fitting any of them together.

Attaching EXTRA boards

Carefully line up all the pins of the PiFace™ EXTRA board with all the sockets on the PiFace™ Relay+. Once aligned, gently push the EXTRA board in until flush.

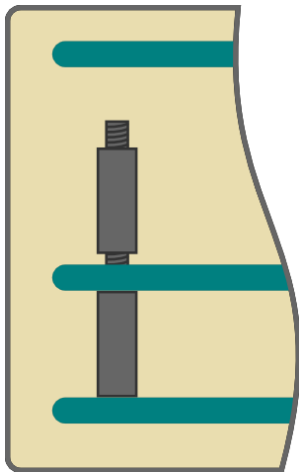


*PiFace™ EXTRA board simplified in this diagram.

Mounting PiFace™ Relay+ on the Raspberry Pi®

To stop the PiFace™ Relay+ board from wobbling, use the plastic spacer provided. Fit it in the mounting hole that is circled in the diagram above. When attaching a PiFace™ EXTRA board, use the plastic spacer provided with it in the board's only mounting hole, also circled above.

Ensure any spacers are properly lined up, then gently push the Raspberry Pi®'s GPIO pins into the connector. When stacking multiple PiFace™ Relay+s, fit the spacers first before connecting the PiFace™ Relay+ boards.



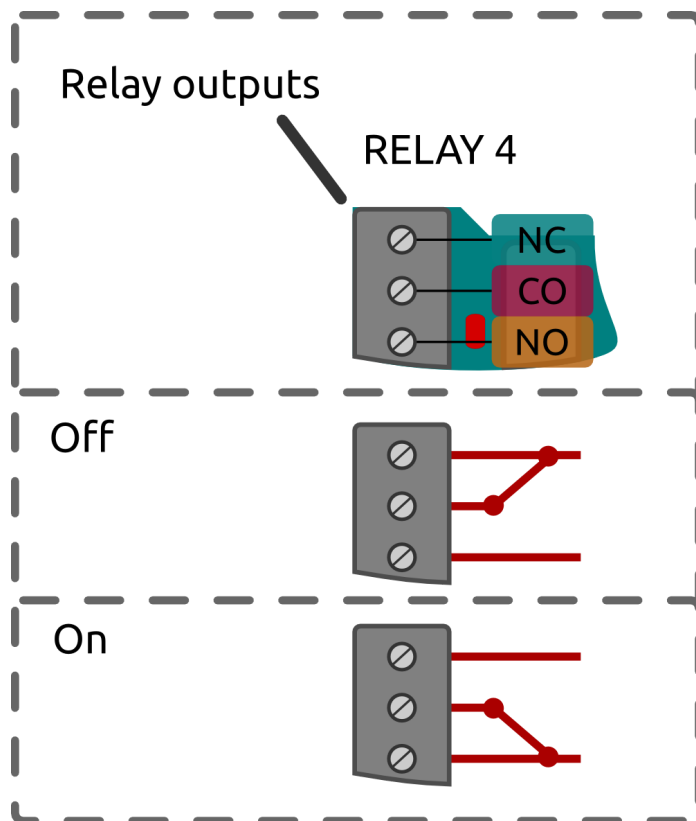
Hardware features

4 relays

PiFace™ Relay EXTRA has 4 relays. Each relay is connected to 3 screw terminals. Their function is printed on the underside of the PCB and shown in the diagram below.

- NC - Normally Closed contact
- CO - COmmon contact
- NO - Normally Open contact

NC and CO contacts will be electrically connected until the relay is activated, at which point CO changes over to connect to NO.



Max switching values: 1A 20V.

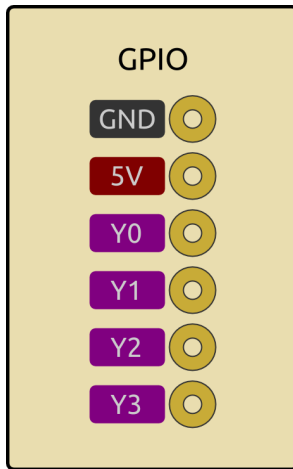
LED indication

Each relay is paired with a red LED next to it, to provide visual indication of operation.

GPIO I/O port

PiFace™ Relay EXTRA has 4 general purpose input output (GPIO) pins. These are made available through 0.1" pin header holes in a 1 by 6 configuration including 2 extra connections to GND and power as shown below. When configured as inputs, a GPIO connected to GND will

register in software with a value of 1. The inputs have software switchable pull up resistors to 3V3.



Warning

Never connect the power (5V) and ground (GND) pins together as this will create a short-circuit.

Installing software under Linux

Refer to PiFace™ Relay+ getting started guide for notes on software installation.

Writing an example Python program for Relay EXTRA

This example will walk you through how to write a Python program for to turn a relay on with PiFace™ Relay+ and Relay EXTRA. To write your program, open a Terminal window on your Raspberry Pi® and type `nano relayonoff.py` to create the program file.

Note:

When you initialise your PiFace™ Relay+ you will have to specify that you are using a PiFace™ Relay EXTRA board. The Relays on PiFace™ Relay EXTRA are address 4-7.

Import the Relay+ module and the time module (which you will use for delays).

```
import pifacerelayplus
import time
```

Now initialise your Relay+.

```
pfr = pifacerelayplus.PiFaceRelayPlus(pifacerelayplus.RELAY)
```

In this line the `pifacerelayplus.RELAY` refers to the PiFace™ EXTRA board you have attached.

Write the following code to toggle the Relay 4 on PiFace™ Relay EXTRA, pause and then toggle it again.

```
pfr.relays[4].toggle()  
time.sleep(2)  
pfr.relays[4].toggle()
```

Save your program by hitting Ctrl-X then Y. Now run your program in the Terminal window to see LED4 flash and hear Relay4 click.

```
python3 relayonoff.py
```

Warnings

- PiFace™ Relay+ and PiFace™ EXTRA boards are not intended for use in critical systems.
- Do not expose to water, moisture or extremes of temperature (below -40°C or above 85°C).
- Take care whilst handling to avoid mechanical and electrical damage to the device and connectors.
- Take suitable precautions to minimise risk of causing damage by electrostatic discharge.
- Connection to unapproved devices may affect compliance or result in damage to unit and invalidate any warranty.
- Connections to PiFace™ Relay+, including connecting external circuits and PiFace™ EXTRA boards, should only be made with the power supply disconnected.
- Ensure that PiFace™ Relay+ and PiFace™ EXTRA boards are powered by a suitably rated power supply that complies with the relevant regulations and standards applicable to the country of intended use.

Compliance information

- This PiFace™ board complies with the relevant provision of the RoHS Directive for the European Union. In common with all Electronic and Electrical Equipment this PiFace™ board should not be disposed of in household waste. Alternative arrangements may apply in other jurisdictions.
- PiFace™ Relay+ board is CE marked. It is a class B product. The EMC emission test was performed with a PiFace™ Relay+ to a Raspberry Pi® Model B+. Due to the nature of the board, as a prototyping and development board, fast transient immunity tests and conducted radio-frequency immunity tests have not been executed. ESD handling precautions should be observed. The board may be considered a component if

integrated into another product. Any person designing or developing a product that uses one or more PiFace™ Relay+ boards is responsible for ensuring that it is compliant and any modification to a PiFace™ board or inter-connection of other elements and devices with a board does not change compliance.

- This Class B digital apparatus complies with CAN ICES-3 (B). Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

<http://www.piface.org.uk>

PiFace™ is designed in the UK by OpenLX SP Ltd. Registered Office 145-157 St John Street, London, EC1V 4PW.

PiFace™ is distributed by Premier Farnell UK, 150 Armley Road, Leeds LS12 2QQ, UK

Manufactured in the UK.

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