

User Manual for the Raspberry Pi Open Collector Output Accessory Board

Thank you for purchasing the Raspberry Pi accessory board. The board is designed to provide a simple and reliable way to control higher power loads from any Raspberry Pi. A single fixing hole is available on the board and this lines up with one of the fixing holes on later Raspberry Pi boards. Please note that although the early Pi did not have fixing holes, the accessory board still connects and operates in the same way.

Board description

The open collector output board features eight separate channels. Each channel can drive up to 500mA at the terminal on the edge of the board. The channels are turned on and off using eight GPIO pins on the Pi. Each output is a transistor collector which will pull the switched line low when it is active. The load may use up to 28 Volts as long as the current drawn remains at 500mA or less.

The ninth terminal on the output terminal block is connected to the high side of the loads or the positive line of the power supply. Every output pin has a reversed biased diode between the output and the power supply. The diode protects the driver transistors against voltage spikes when turning off inductive loads (motors, relay coils etc). The board offers a choice of three power inputs.

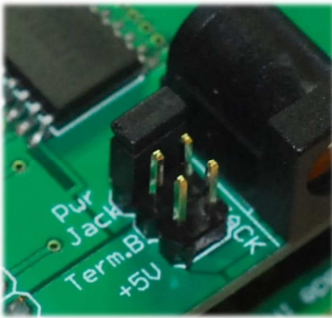
Installing the board

Installation couldn't be easier. First, ensure that the Pi and the accessory board are not powered by removing all connectors from both. The board connects to the Pi using the 2 row, 26 way connector. The two PCBs should look like the picture to the right. If you wish to use the fixing holes, please use 3mm machine screws or similar with spacers to fix the boards into place. There are many ways to fix the boards and for that reason, we do not include mounting hardware.



Powering the accessory board

There are three options for powering the output board and the loads that it drives. The power source can be selected using the header pins and the jumper on the output board. 5V may be drawn from the Pi 26 pin connector. This is typically used for low power devices and the total load should be less than 1000mA. The power supply used to power the Pi must be capable of handling the additional load. To select this option, move the jumper to the +5V pins on the board. A power supply with a standard power jack may be connected to the coax jack socket on the accessory board. Connect the jumper to the Jack pins on the board (as shown on the image to the left). Finally, power can be connected using the 2 way terminal block next to the DC jack. In this case, connect the jumper to the pins marked "Term.B". Power applied to the DC jack or the terminal block may be up to 28 Volts and can be selected to suit the loads being driven.



In certain cases, it is possible to power the Pi from the accessory board. The power supply used for the accessory board **MUST** be a 5V DC stabilised output. It can be connected to either the DC jack or the terminal block on the accessory board. Connect the jumper to the appropriate pins as described above. Finally, take another jumper (not supplied) and connect it to the +5V pins. Power will now be passed to the Raspberry Pi. When using this technique, ensure that no other power source is connected to the micro USB port on the Pi. **Warning:** If this power connection is used with a power supply other than 5V DC, it is likely that the Pi will be damaged beyond repair.

Using the board

Each of the eight outputs are driven by a separate GPIO pin. To operate an output, first, set the relevant GPIO to be a digital output, turning off any additional functions that may be assigned to the same pin. Then, turn the GPIO pin to "1" or "on" to turn on the open collector output. An LED next to the output connection terminal will light to indicate that the output is active.

Output 1	GPIO 4
Output 2	GPIO 17
Output 3	GPIO 18
Output 4	GPIO 22
Output 5	GPIO 23
Output 6	GPIO 24
Output 7	GPIO 25
Output 8	GPIO 26

Support

If you have questions, we are always happy to help. Contact us on

0800 118 2308
24 Gould Close, Newbury, Berkshire, RG14 5QN
info@greenlightav.com www.greenlight-automation.com