Compact Motor Driver Board for the Raspberry Pi Pico

www.kitronik.co.uk/5331

Introduction: This compact motor driver board for the Raspberry Pi Pico allows 2 motors (or 1 stepper motor) to be driven simultaneously with forward, reverse & stop control, making it ideal for designs such as buggies. It is based on the DRV8833 motor driver IC, which has built in short circuit, over current and thermal protection.

It also features 4 external connections to GPIO pins and a 3V and GND supply from the Pico. This allows additional IO to be connected to the motor driver board and the state of these can then be read or controlled by the Pico.

Power is provided via either a terminal block or servo-style connector, the supply is then controlled by an on/off power switch to the board. There is a green LED to indicate when the board is turned on. The power connections are reverse polarity protected.

The board produces a regulated 3V supply that is fed into the 40 way connector to power the Pico, removing the need to power the Pico directly.

Inserting a Pico: To use the motor driver board the Pico should have soldered pin header and be inserted firmly into the connector as shown.
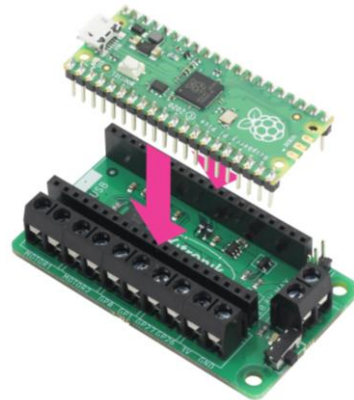
Example Pico Code:

Kitronik have developed a micro-python module and sample code to support the use of the Motor Driver board with the Pico.
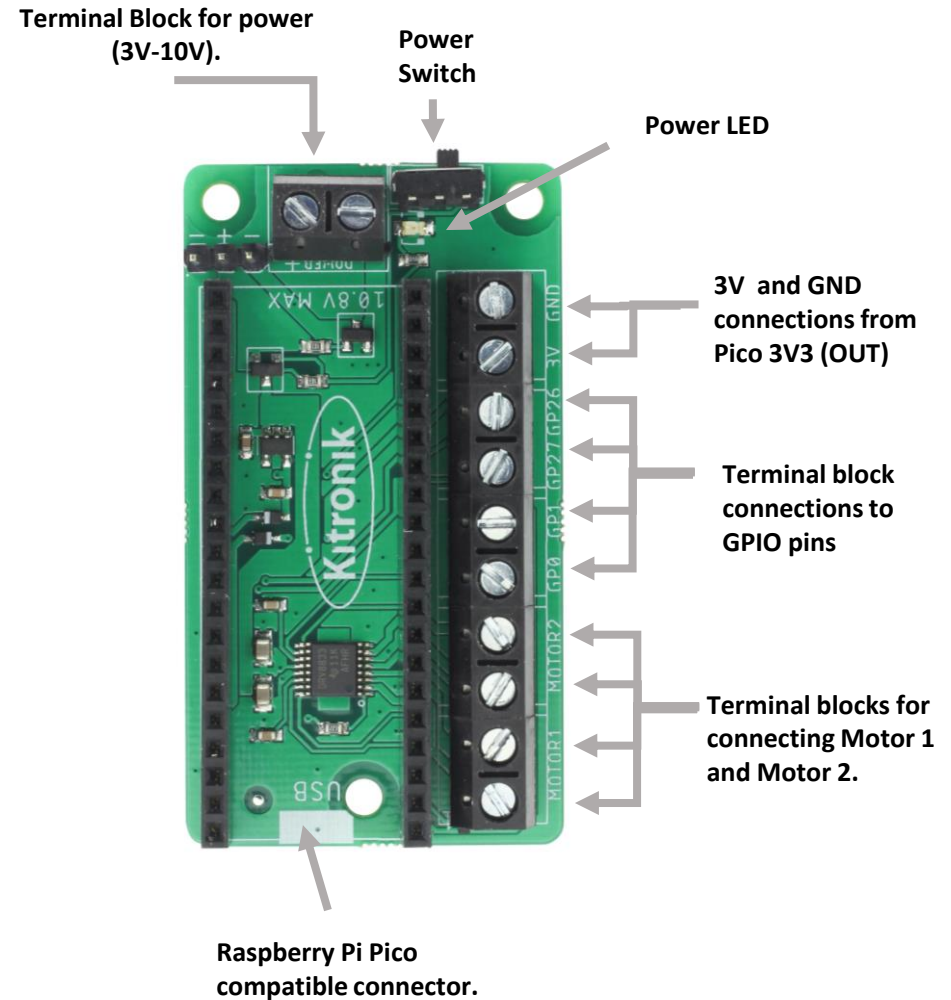This code is available in the GitHub repo at:
https://github.com/KitronikLtd/Kitronik-Pico-Motor-Driver-Board-MicroPython

A Circuit Python version is also available at:
https://github.com/KitronikLtd/Kitronik-Pico-Motor-Driver-Board-CircuitPython

Layout:

Terminal Block for power (3V-10V).

Power Switch

Power LED

3V and GND connections from Pico 3V3 (OUT)

Terminal block connections to GPIO pins

Terminal blocks for connecting Motor 1 and Motor 2.

Raspberry Pi Pico compatible connector.

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Electrical Information

Operating Voltage (Vcc)	3V to 10V
Number of motor channels	2 (2 motors with forward + reverse control, controlled by GP2 &GP3, GP6 & GP7 or 1 stepper motor with coils connected to GP2 &GP3, GP6 & GP7)
Typical motor output Voltage (Vm) @ 1.5A output per channel	Vm = Vcc
Max Current per motor channel	1.5A
GPO Pins	GP0, GP1 (Default UART). GP27,GP28 (ADC0, ADC1)
Digital output drive current	4mA

Motor Control Pins (forward and reverse directions can vary depending on how the motors are connected)

GP2	GP3	Motor 1 Function
0	0	Coast
1	0	Forward
0	1	Reverse
1	1	Brake

GP6	GP7	Motor 2 Function
0	0	Coast
1	0	Forward
0	1	Reverse
1	1	Brake

Dimensions

(All measurements are given in mm)
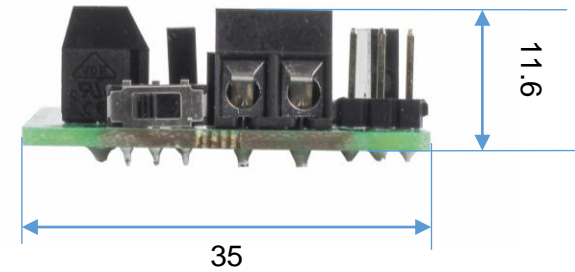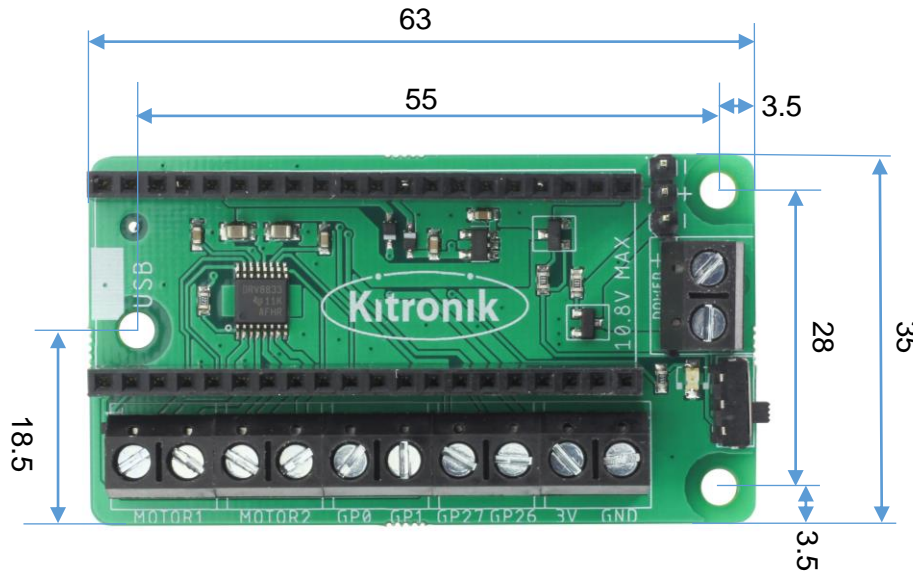
Mounting holes are 3.3mm (M3 clearance) in diameter

(Dimensions +/- 0.8mm)

The PCB is 1.6mm thick