



# IO Pi Zero

## Features

- 16 Digital Inputs/Outputs
- Control via the Raspberry Pi I2C port
- Stack up to 8 IO Pi boards on a single Raspberry Pi
- Solder pad selectable I2C addresses
- External 5V Input with isolation pad
- Based on the MCP23017 from Microchip Technologies Inc
- Configurable interrupt output pins - Configurable as active-high, active-low or open-drain

- INTA and INTB can be configured to operate independently or together
  - Configurable interrupt source - Interrupt-on-change from configured register defaults or pin changes
  - Polarity Inversion register to configure the polarity of the input port data
- The IO Pi Zero is a 16 channel digital expansion board designed for use on the Raspberry Pi Zero. The board is based around the MCP23017 16-bit I/O expander from Microchip Technology Inc. A MCP23017 expander is included on the board allowing you to connect up to 16 digital inputs or outputs to the Raspberry Pi. The IO Pi Zero Expander is powered through the host Raspberry Pi using the GPIO port and extended pins on the GPIO connector allow you to stack the IO Pi Zero along with other expansion boards.

The I2C address bits are selectable using the on-board jumpers. The MCP23017 supports up to 8 different I2C addresses so with one MCP23017 device on each IO Pi Zero you can stack up to 8 IO Pi Zero boards on a single Raspberry Pi giving a maximum of 128 I/O ports.

The IO Pi includes a 5V port that can be isolated from the Raspberry Pi via an isolation solder jumper so you can use a separate high current power supply to power the IO Pi reducing the load on the Raspberry Pi. Use of an external supply is recommended if you plan on connecting more than one IO Pi to your Raspberry Pi.

## Assembly

The IO Pi Zero is supplied with the 40 pin GPIO connector unsoldered.

We supply the IO Pi Zero this way because the Raspberry Pi Zero is also supplied without a GPIO header and the IO Pi Zero could therefore be fitted both above or below the Raspberry Pi Zero.

Before using the IO Pi Zero you will need to solder the 40 pin GPIO connectors onto the PCB.

## I2C Address Selection

The MCP23017 contains three address select pins which can be tied to Vss or Vdd. This gives 8 possible I2C addresses for each chip. To simplify address selection on the IO Pi Zero we have included a set of address selection pads which can be configured by applying a small solder bridge across the required pads. The I2C

address table show the recommended configurations for your IO Pi Zero and the associated I2C addresses.

Note: Disconnect the IO Pi Plus from the Raspberry Pi before changing the i2c address. The address pins are tied to GND (low) via a 10K resistor so the jumper is used to tie a pin to Vcc (high).

Default Configuration (IC1 = 0x20, IC2 = 0x21)

