

# PC Services – Raspberry Pi GPIO Expansion Boards

**NEW**

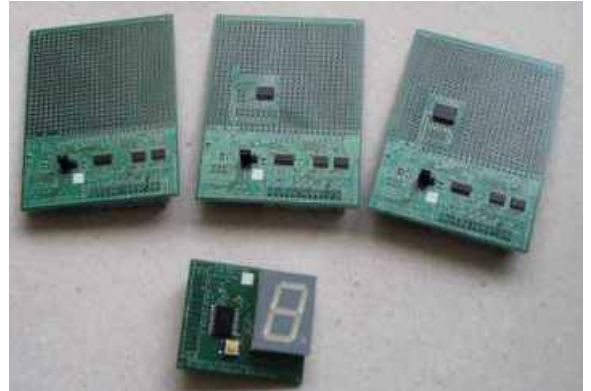
## Raspberry Pi GPIO Expansion Series

With Tutorials

Having trouble interfacing with the Raspberry Pi?

Would you like -

- ♦ to add a circuit and not worry about the different voltage levels of the Raspberry Pi?
- ♦ to protect your Raspberry Pi from GPIO circuits with up to 15kV ESD protection?
- ♦ an easier way to connect your small circuit to the Raspberry Pi?
- ♦ to have an easy way to connect your circuits to the Raspberry Pi?
- ♦ several tutorials to build up your ability to interface with the Raspberry



**Our Raspberry Pi GPIO Expansion board Series Can Help**

The PC Services GPIO Expansion series features

- ♦ Fully bi-directional GPIO expansion on **all** GPIO lines transparently
- ♦ Level Translation between 3.3V Raspberry Pi and your circuit typically 5V (you can choose other voltages<sup>2</sup>)
- ♦ Isolation of Raspberry Pi and your circuit when the Raspberry Pi is turned off or whilst being connected<sup>1</sup>
- ♦ ESD protection between your circuit and Raspberry Pi of up to **15kV**<sup>1</sup>
- ♦ Connector mounted on board for **direct** connection to Raspberry Pi no extra cable to make
- ♦ Interface and level translation circuit already on the board<sup>1</sup>
- ♦ Prototyping area of 0.1 inch matrix holes to solder your components to
  - All GPIO pins available as Matrix holes **labelled** in groups for easy connection
  - +5V and GND matrix of holes top and bottom of card for easy power wiring
  - Matrix holes laid out with groups of 3 matrix holes connected together to save on wires or strip board cutting
- ♦ I2C Connector so you can daisy chain boards or interface to your I2C device that has to be a distance away.



- ♦ Tutorials and kits of parts to build up a variety of circuits, several levels
  - Start with simple LED and switch
  - Convert simple I/O to simulate Process Control or an alarm system
  - Add motion detection and other sensors to create an extensive alarm system
  - Add I2C, SPI and serial I/O
  - More planned...

**Don't want to actually build up boards, but want something to connect straight away?**

Well PC Services has a range of boards and newer ones on the way, most with Prototype area to expand the board later. We have several options

- ♦ Basic Breakout and Prototype area board
- ♦ 7 Segment Display and switch input
- ♦ 8 bit GPIO via I2C plus Prototype area

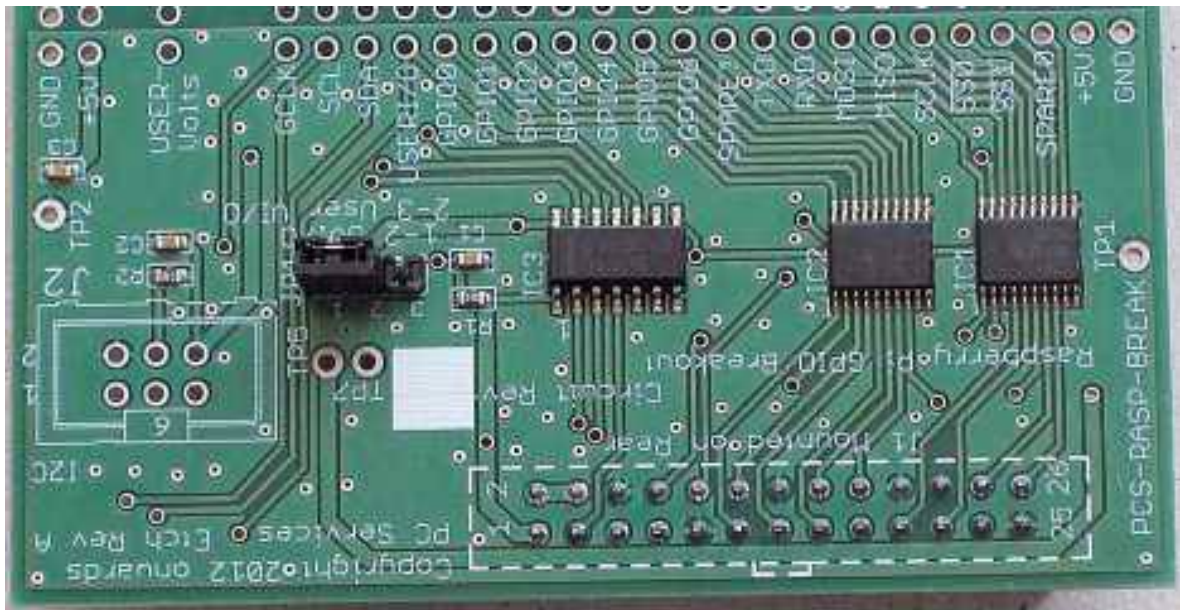
## PC Services – Raspberry Pi GPIO Expansion Boards

- ◆ 16 bit GPIO via I2C plus Prototype area
- ◆ More planned for items such as
  - Analogue I/O,
  - LCD character display
  - LCD character display with switches and LEDs.

### Easy Connection to Raspberry Pi

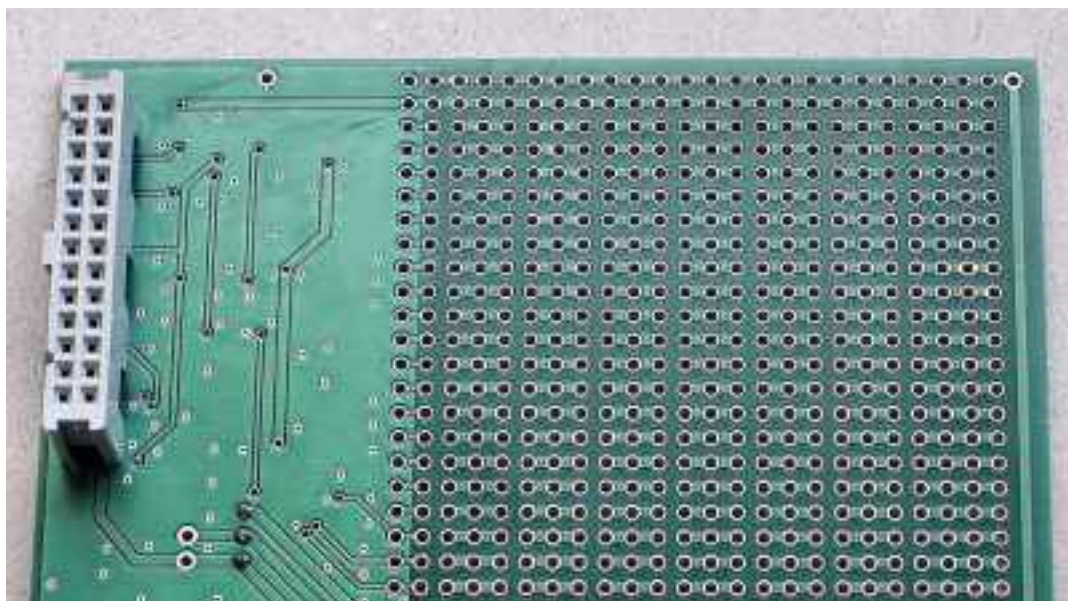
Because the connector to the Pi is mounted on the bottom of the GPIO board, the PC Services GPIO boards plug directly onto the GPIO connector of the Raspberry Pi.

### Here is a close up of the Basic Expansion Board



Here is a detailed view of the prototype area; there are tracks connecting the holes on the board in groups for easier layout. Note that

- ◆ the +5V and GND are available along the length of the prototype area top and bottom of the prototype area.
- ◆ All GPIO signals are brought out to a pair of labelled wiring points.



### About PC Services

We have been consulting in computing, embedded microprocessors and electronics since 1994. PC Services has a wide experience in producing solutions from 'Payroll to Body Scanners' using the best methods available.

## PC Services – Raspberry Pi GPIO Expansion Boards

This experience has been used to create products used in medical devices, electronic test equipment, educational aids and many other areas for educational, commercial, avionics and military environments.

As such PC Services has interfaced equipment to many types of standard and non-standard interfaces, with embedded microprocessors and dedicated hardware, for various levels of precision.

See our web site for more details on past projects and areas covered, including our own engineering font used throughout the world.

### Notes:

- 1/ Whilst protection is provided by our interfaces, we cannot obviously protect from problems beyond the scope of our products. For example connecting mains electricity, or putting too much load onto the Raspberry Pi.
- 2/ Users can supply their own voltages to drive their circuits and signals, by changing a jumper the user added voltage supply can be connected to the level translators, but must be between 1.7V and 5.5V.
- 3/ User circuits must not draw excessive currents from the Raspberry Pi or attempt to put excessive currents (by default 8mA maximum) on any single GPIO pin

### Example of GPIO Board being used in a project

This is a GPIO board with 16 bit I2C GPIO chip, which has had added to it

- ◆ 4 input switches
- ◆ Motion Detector
- ◆ Connector for 3 extra switch inputs
- ◆ LCD display (16 characters by 2 rows)

Date: 14/11/2012

Raspberry PI GPIO Product Brief

