

# Digital Pot Adapter v1.0

## Mini Manual



### 1. Introduction

Many motor controllers require a resistive throttle input, historically using 2-wire 0-5Kohm throttle devices. Internally these use a physical potentiometer with sliding contacts on a resistive strip, which often wear out and grow unreliable in time. Hall effect throttles are based on non-contact magnetic proximity sensors with a virtually unlimited life, and represent a more reliable throttle system for vehicles.

This device, based on a solid-state digital potentiometer, offers a simple and inexpensive solution for using modern hall effect throttles with legacy resistive throttle motor controllers.

### 2. Wiring

The device uses a total of seven wires, as per the diagram below:



**12V input and ground:** The red and black wires represent 12V & ground respectively.

**0-5V throttle input:** The yellow wire is a 5V output supplying power to the input throttle device (50mA max) such as a hall effect potbox, and the black wire is ground. The white wire carries the 0-5V throttle level.

If you already have a 5V supply available (such as when driven from a vehicle's factory hall effect accelerator pedal, you can optionally connect it to the yellow 5V wire and omit the 12V input supply wiring above. (If so, remove the 12V wiring completely.)

**Resistive output:** The two grey wires are the outputs, to be connected to the two throttle 0-5kohm inputs on your controller. The output is galvanically isolated from the input; this device will not couple the vehicle's 12V system and traction circuit in any way.

### 3. Installation location

---

The Digital Pot Adapter is best installed close to the throttle device, rather than close to the controller. There are two 3.2mm (1/8") holes spaced 72.5mm apart which should be used to secure the device in the vehicle with two screws. (These also lock the two halves of the case together.)

### 4. Polarized output

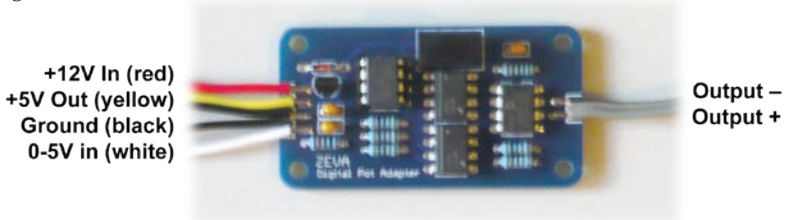
---

Due to the nature of digital potentiometers, the two output wires are polarized - that is, one wire must be more positive than the other. One of the grey output wires has a black stripe on it, which is the more negative wire. Nothing will be damaged if you get the polarity wrong at first, it will simply do nothing. If everything is connected but the throttle is unresponsive, try reversing the two throttle wires going to the controller.

### 5. Rewiring

---

If you are competent at soldering, you may wish to open the case and re-solder your own wiring directly to the internal circuit board. The PCB connections are shown on the diagram below.



### 6. Throttle ramp

---

By default, this device is designed to accept a full-range 0-5V input, representing a scale of 0-100% throttle, and translates it linearly to a 0-5Kohm output resistance. Sometimes hall effect throttles will not provide a full-scale 0-5V range – some will be around 0.5V to 3.5V for example. In such cases, the microcontroller can be reprogrammed to include scaling factors accommodating for this. Please contact us to discuss further.

### 7. Support

---

Can't get it to work? Feel free to contact us via <http://www.zeva.com.au/contact.php> (Please send a description of your throttle device, motor controller, and details of what you've tried so far.)

### 8. Specs in brief

---

- Input voltage supply: 7-30VDC (12v nominal)
- Power consumption: ~10mA
- Throttle input: 0-5VDC
- Output: 0-5kohm resistance, polarized