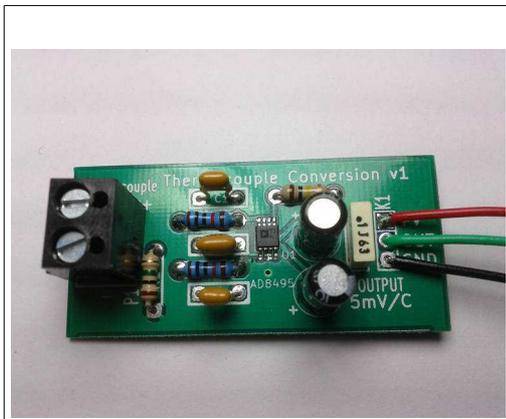


AD8495 Thermocouple Amplifier

Date:	08/01/14	Version:	1.0	By:	Matt Little
-------	----------	----------	-----	-----	-------------



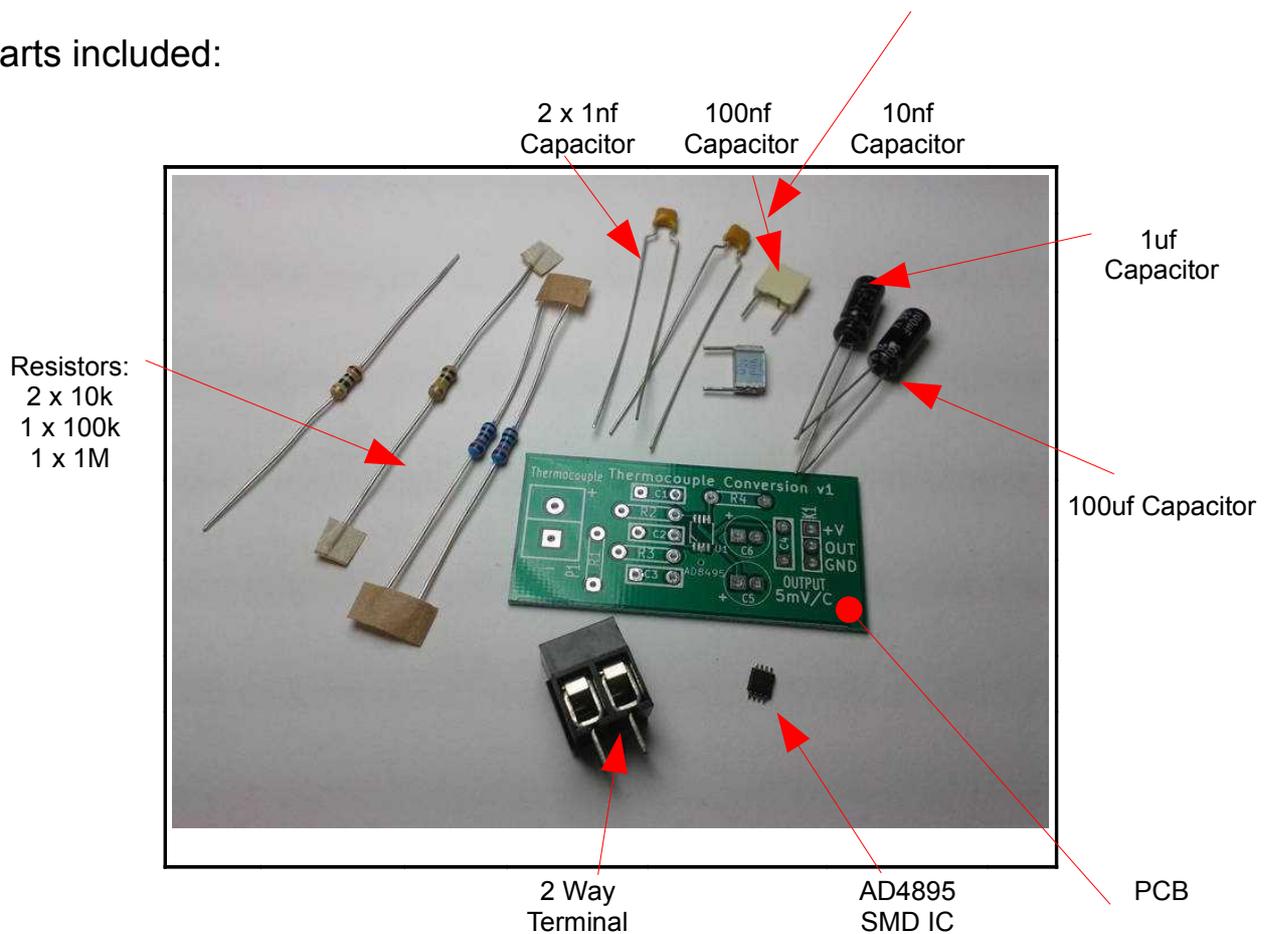
This **Thermocouple Amplifier Kit** is based upon the AD8495 precision K-type thermocouple amplifier. This can be used to measure very high temperatures, with a range up to 1000C (depending upon the rating of the thermocouple). The output is a voltage equal to 5mV per degree with a linear scale. This makes it very easy to measure with an analog input to a microcontroller (such as the Arduino).

Note: No thermocouple probe is included in this kit – please purchase separately for your application.

Data sheet for the AD8495 is available here:

http://www.analog.com/static/imported-files/data_sheets/AD8494_8495_8496_8497.pdf

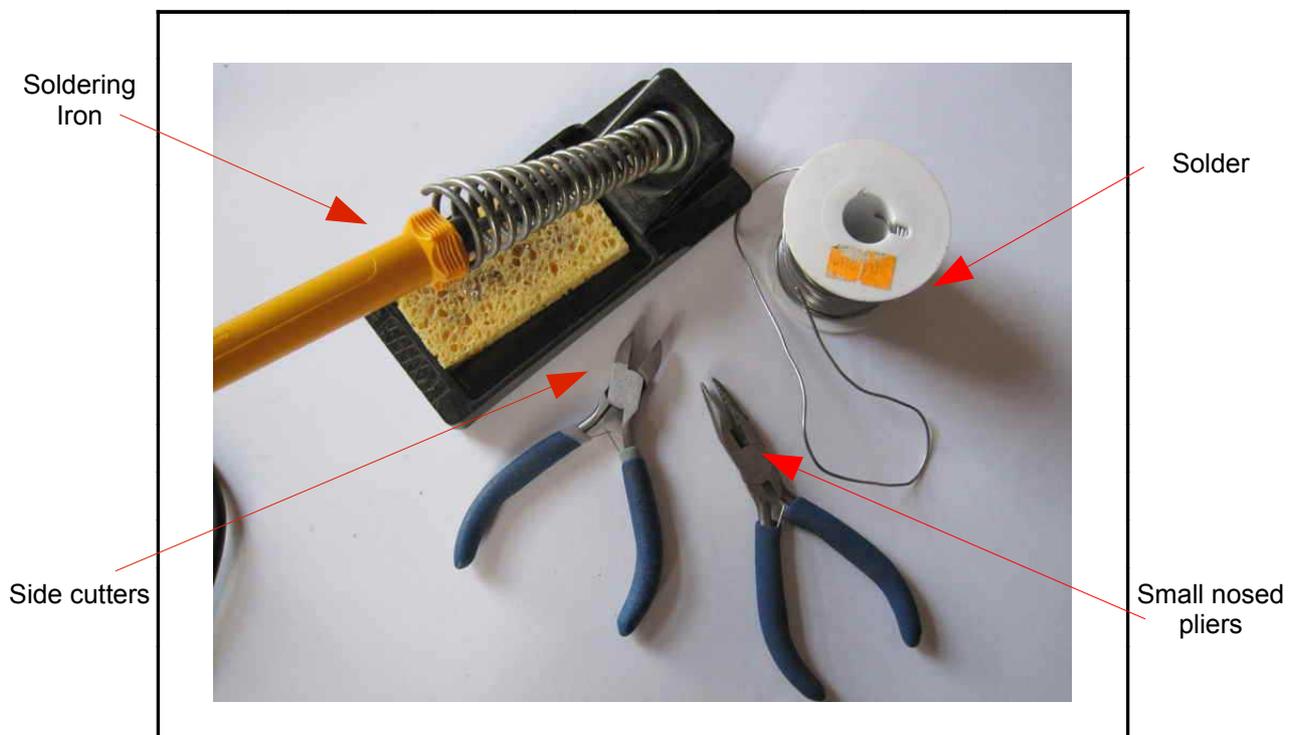
Parts included:



Parts list:

Ref	Value and description
C1	1nf capacitor
C2	10nf capacitor (might vary from photo)
C3	1nf capacitor
C4	100nf capacitor
C5	100uf capacitor
C6	1uf capacitor
K1	DATA – Solder pads
P1	Thermocouple – Screw terminals for the therm
R1	1M resistor
R2	10k resistor
R3	10k resistor
R4	100k resistor
U1	AD8495 SMD K-type Termocouple Amplifier

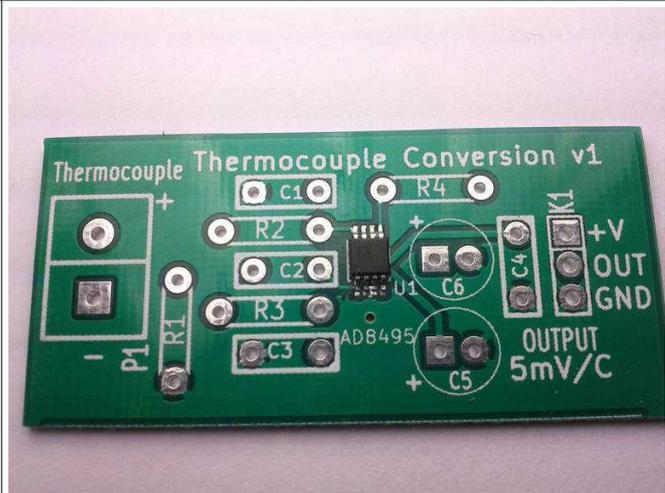
Tools required:



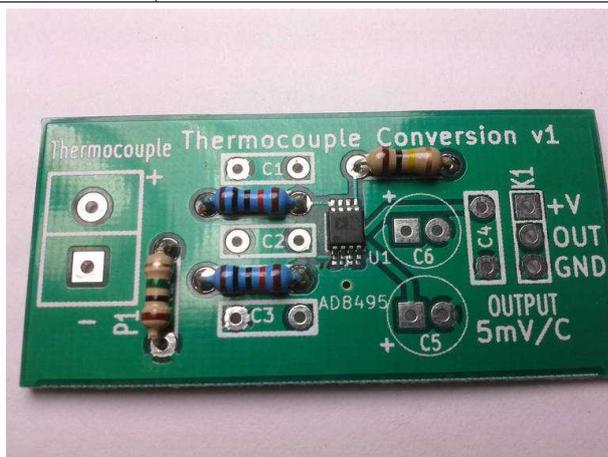
Instructions:

Step: 1 Solder the SMD IC AD8495

Lets start with probably the most difficult soldering step. Its best to do this first, or the other components get in the way. Holding the IC with a pair of tweezers align over the solder pads. Ensure the correct orientation – the dot on the IC will be at the end with the triangle on the PCB. Solder one pin on the corner of the IC. Ensure that the IC lines up with all the other pads. If you need to adjust it then heat the solder on the soldered pin and correct the IC. Once it is aligned then you can solder the whole row of pins on the other side to the already soldered pin. If you heat up the top pin and apply solder then drag down to the bottom pin, applying solder if required. This usually will solder all the pins. You may need to remove any excess solder using some solder wick. Leave this to cool for a couple of seconds. Then use the same technique for the unsoldered side.



Step: 2 Solder the resistors



Identify all the resistors. You will have:

Quantity	Value	Part Reference
1	1M	R1
2	10k	R2,R3
1	100k	R4

Use the identify chart at the end of these instructions or a multimeter. Solder into the relevant places. Their orientation does not matter.

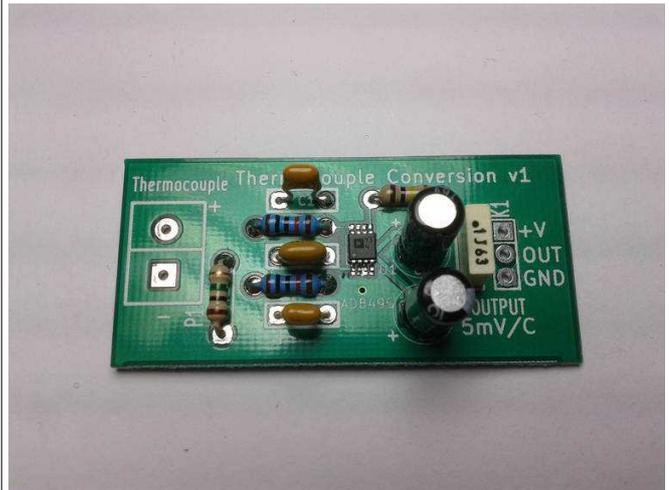
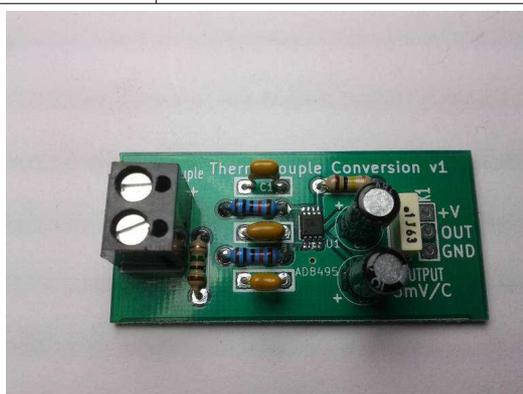
Step: 3 Solder the Capacitors

Identify and then solder in the capacitors.

Quantity	Value	Reference	Photo
2	1nf	C1, C3	
1	10nf	C2	
1	100nf	C4	
1	100uf	C5	
1	1uf	C6	

Capacitors C1-4 can be installed in either direction.

Check the orientation on capacitors C5,C6. The white line on the side signifies negative side. The round pad on the PCB signifies negative. The longer lead signifies positive. The square pad on the PCB is positive.

**Step: 4** Solder the screw terminal block

This will be used to connect the thermocouple wires.

Step: 5	Build is finished!
Have a nice cup of tea.	

Step: 6	Test the device
	<p>To test the device, connect a k-type thermocouple to the screw terminals. Apply 5V power supply to the V+ pin and GND. Measure the output with a multimeter.</p> <p>The output should be +5mV per degree C.</p> <p>In this photo I have heated the thermocouple with a hot air gun and am getting a reading of 1.373V, which equates to: $1.373V / 0.005 = 274C$</p> <p>The error is +/-2C for the range 25C-400C.</p> <p><i>Note: This version cannot measure below zero (but check the data sheet for an application note to do this).</i></p>

Contact details:

This kit has been designed and produced by:

Renewable Energy Innovation.

info@re-innovation.co.uk

www.re-innovation.co.uk

Hopkinson Gallery

21 Station Street

Nottingham

NG7 6PD

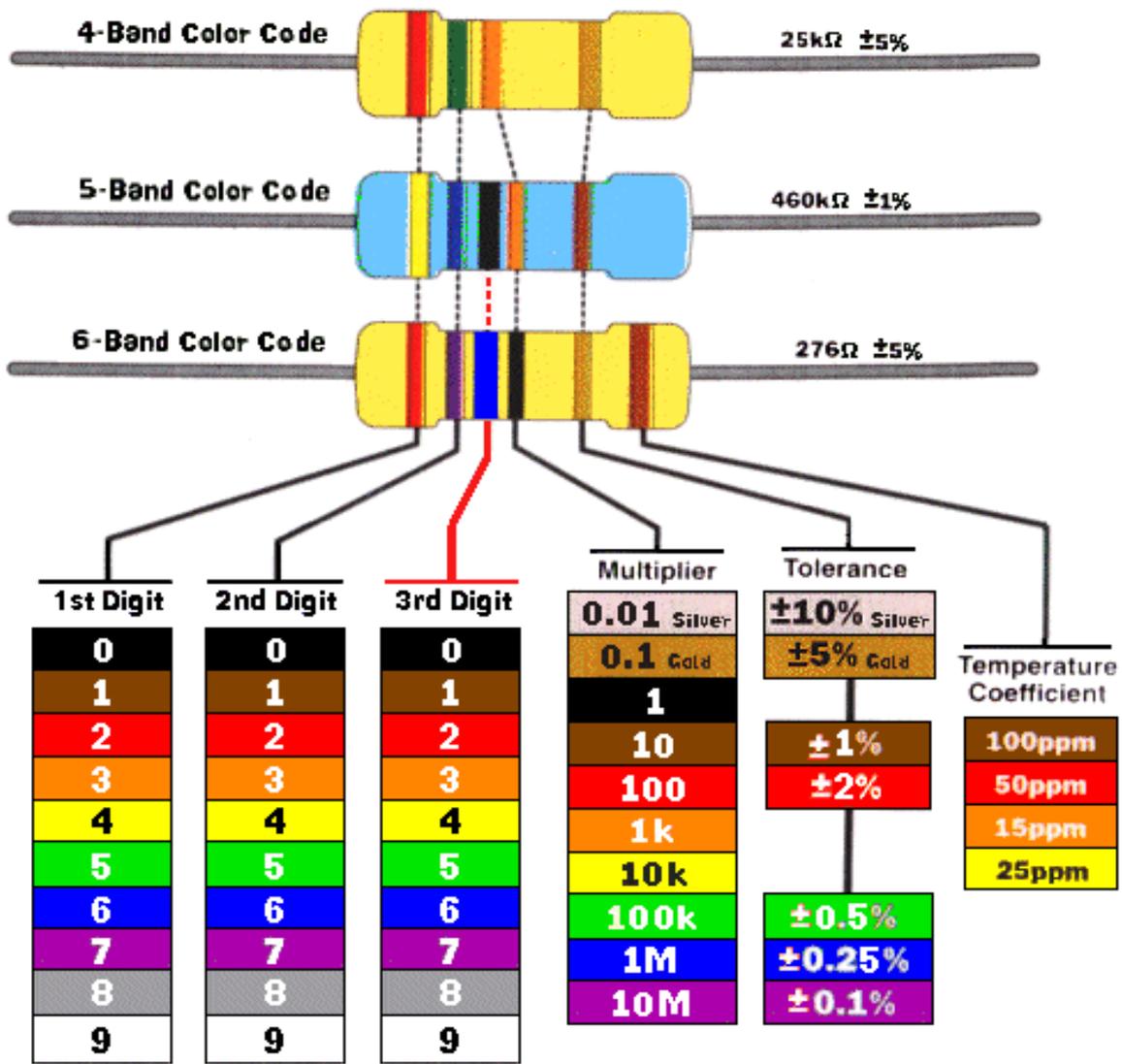
We would like you to be happy with this kit. If you are not happy for any reason then please contact us and we can help to sort it out. Please email info@re-innovation.co.uk with any questions or comments.

If any parts are missing from your kit then please email info@re-innovation.co.uk with details, including where the kit was purchased.

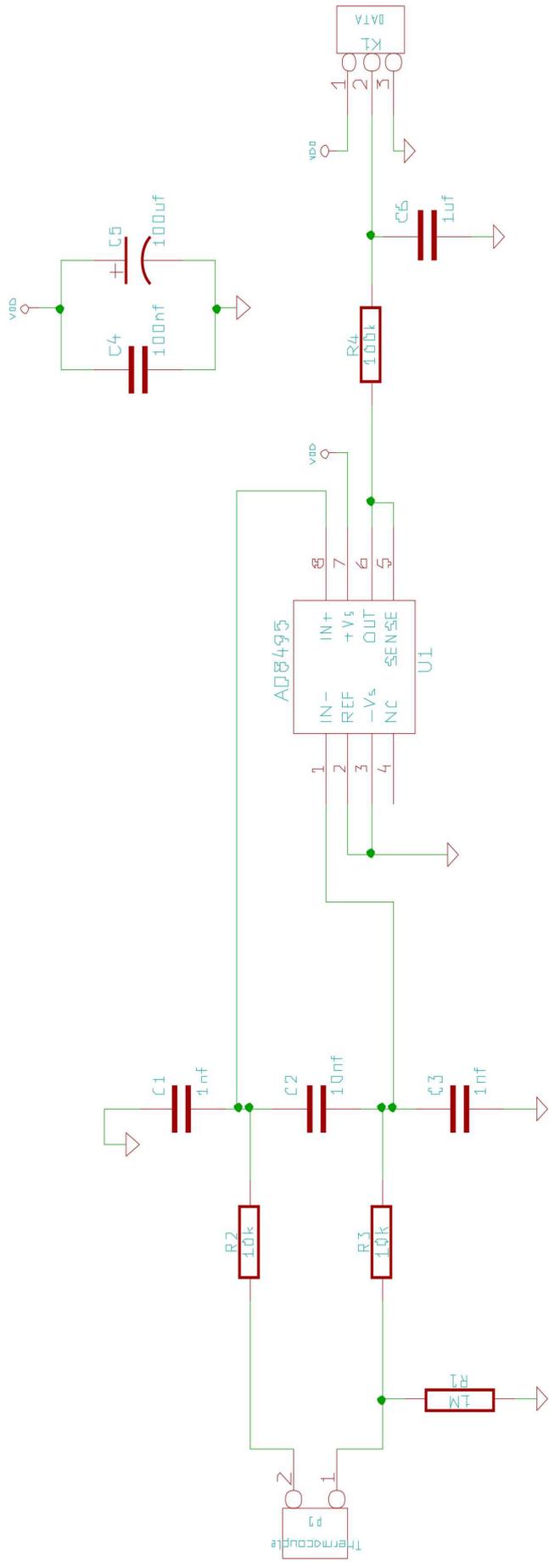
More technical information can be found via www.re-innovation.co.uk.

Useful Information:

Resistor colour codes:



Circuit schematic:



PCB overview:

