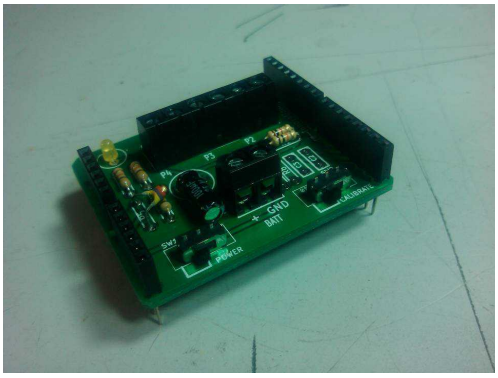
Wind Logger Shield

Date:	29/07/14	Version:	1.0	By:	Matt Little



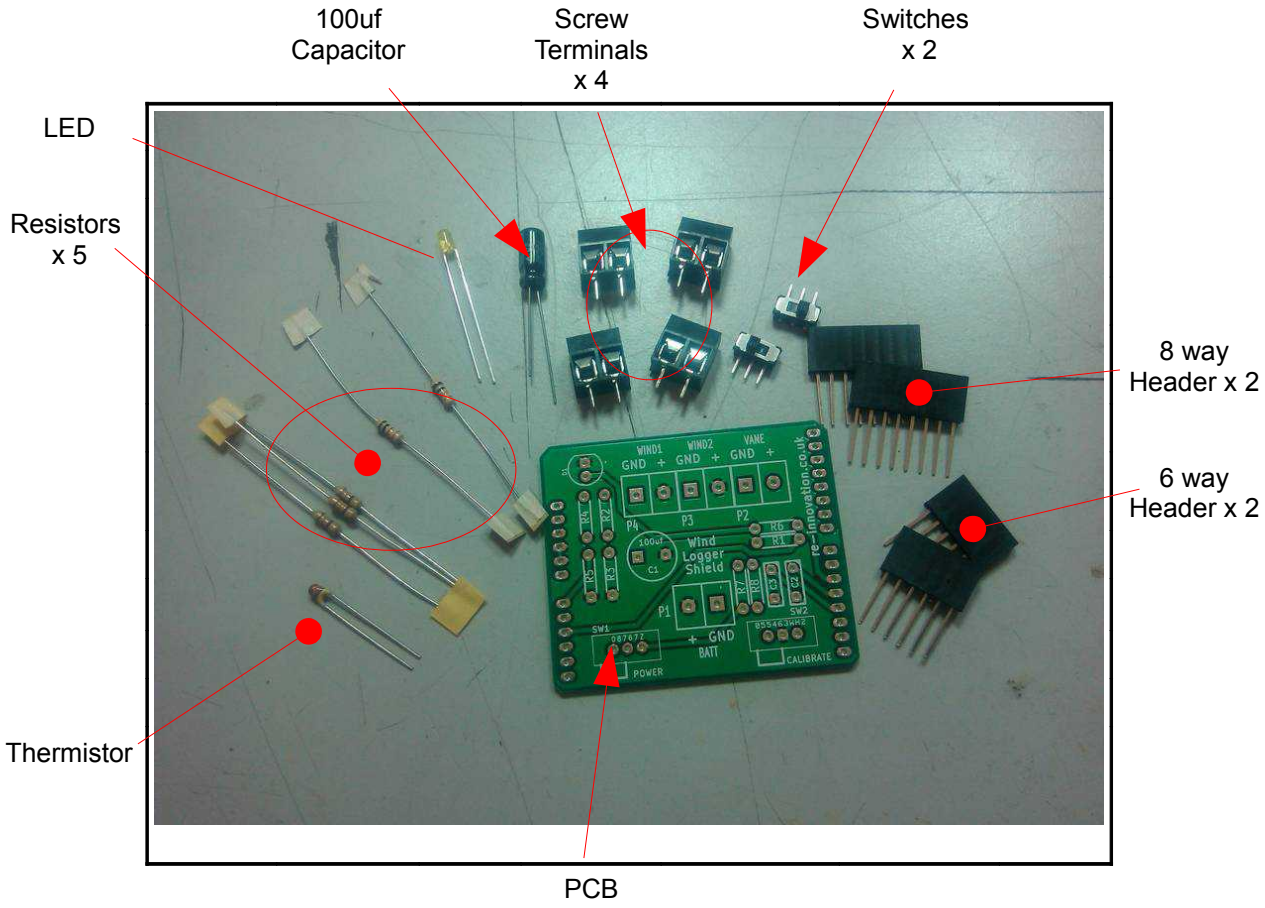
This is a simple shield to easily implement a wind resource data logging system.
It is designed to read 2 x pulse type anemometers and 1 x wind vane.

It is designed as a shield to be added to the **DataDuino**, which is an Arduino data acquisition unit which stores data to an SD card (as a .csv file).

The instructions here show the full build, including mounting in a box (not supplied for the sheild kit).

Note: This requires a DataDuino and an FTDI USB to serial cable for programming.

Parts included:



Parts list:

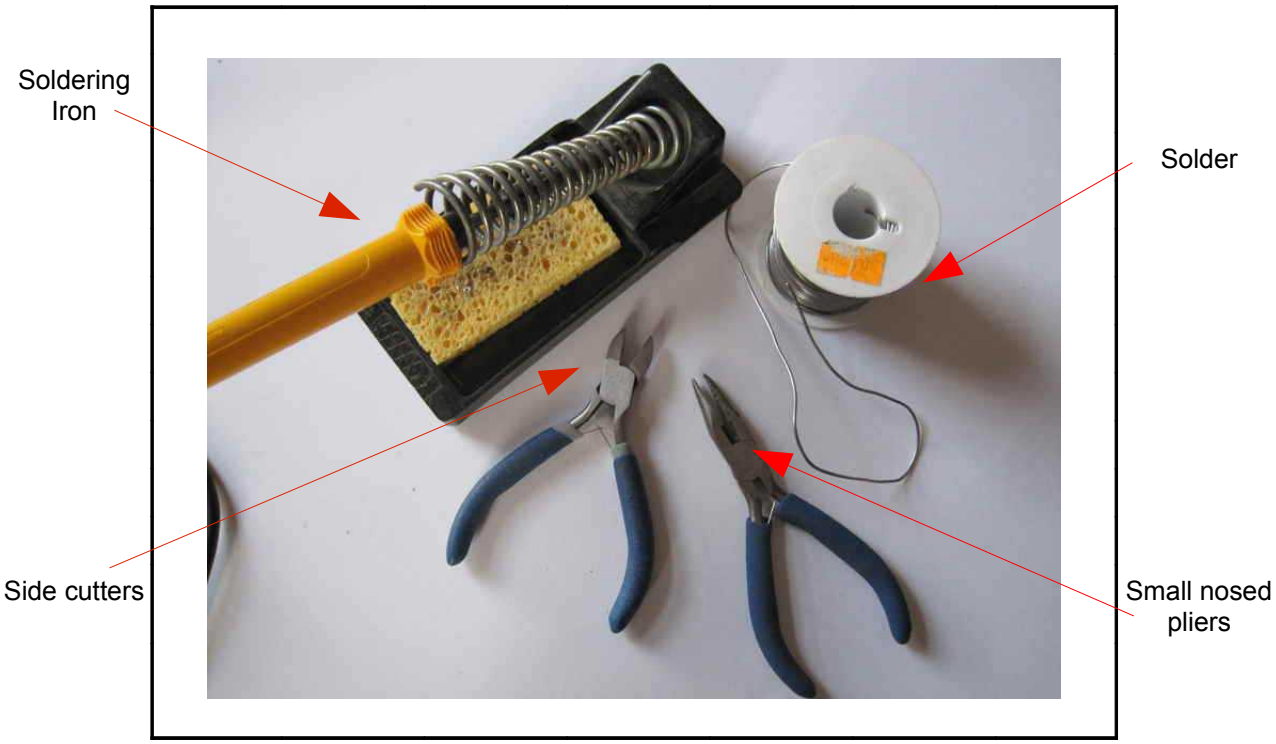
Reference	Description	Reference	Description
C1	100uf Electrolytic Capacitor	R1	10k
C2	Filter capacitor (not included)	R2	47k
C3	Filter capacitor (not included)	R3	47k
D1	LED	R4	47k
P1	2 way screw terminal	R5	Thermistor 47k NTC
P2	2 way screw terminal	R6	1k
P3	2 way screw terminal	R7	Pull up resistor (not included)
P4	2 way screw terminal	R8	Pull up resistor (not included)
PCB		SW1	ON/OFF power switch
PINS	8 way header pins x 2	SW2	Calibrate mode switch
PINS	6 way header pins x 2		

You will also need (not supplied):

- a built DataDuino unit (http://www.re-innovation.co.uk/web12/index.php/en/products-2/dataduino-arduino-data-acquisition-unit)
- a computer with the Arduino IDE installed
- a FTDI USB to serial cable with code: TTL-232R-3V3, such as this:

Available here (among other places):
http://www.ftdichip.com/Products/Cables/USBTTLSerial.htm

Tools required:



Instructions:

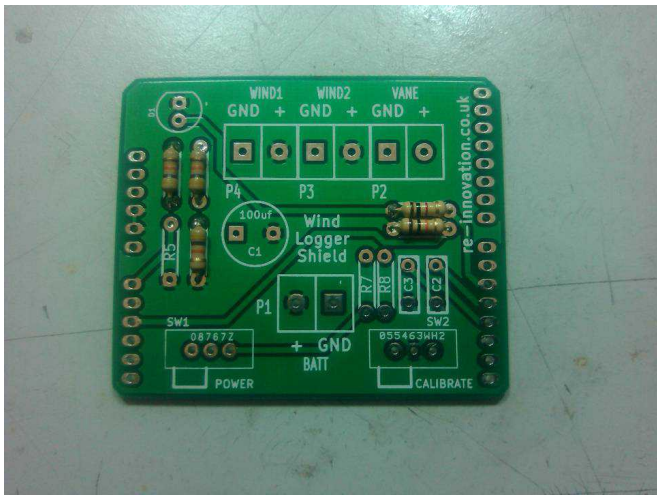
Step: 1	Solder the resistors

Identify all the resistors. You will have:

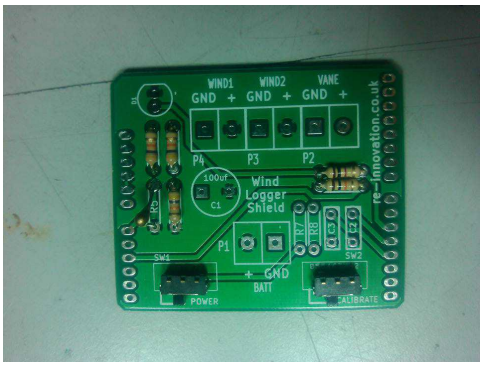
Quantity	Value	Part Reference
1	**10k**	R1
3	**47k**	R2,R3,R4
1	**1k**	R6

Resistor R5 is a thermistor and soldered later.

Use an identify chart or a multimeter to find the resistor values.
Solder into the relevant places.
Their orientation does not matter.



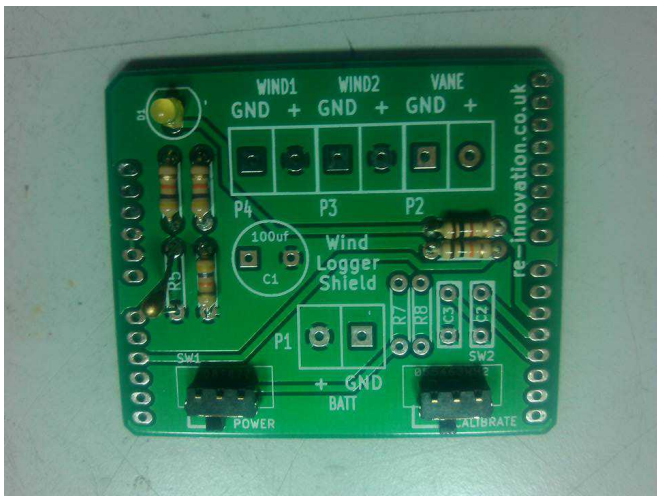
Step: 2	Solder the switches



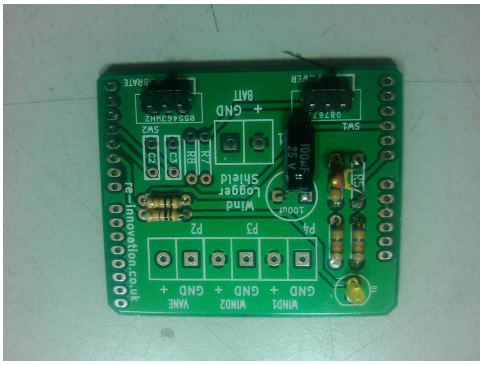
Ensure the switch levers point away from the PCB.

Step: 3	Solder the LED

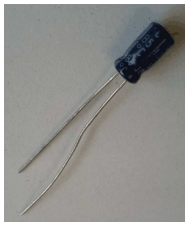
Double check the LED orientation. The long lead is positive. The flat side of the LED body is negative – ensure this matches the PCB white diagram.



Step: 4	Solder the capacitors



Identify and then solder in the capacitors.

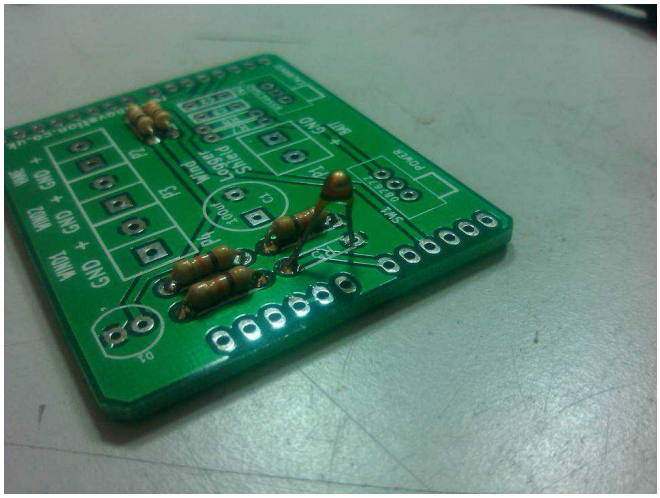
Quantity	Value	Reference	Photo
1	100uf	C1	

Check the orientation on capacitor C1. 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.

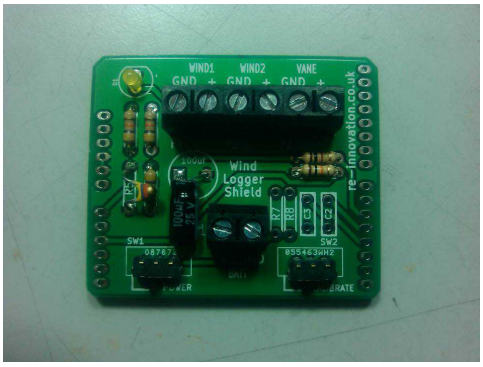
If possible, bend the capacitor to lie flat onto the PCB.

Step: 5	Solder the Thermistor

This fits into the R5 pads.
This can stick out from the board slightly to help monitor the temperature of the air.



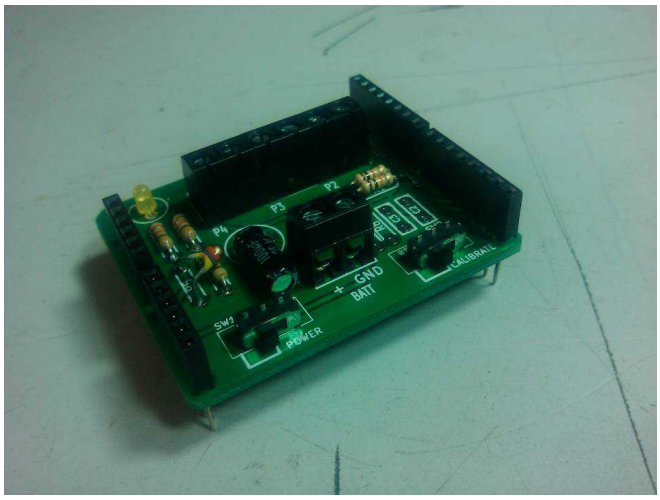
Step: 6	Solder the terminals



The screw terminals link together with special slots – do this for the three in a row.
Ensure they are facing the correct direction: P2/P3/P4 should face up away from the PCB, P1 should face down, away from the PCB.

Step: 7	Solder the pin headers

There are 2 6-way headers and 2 8-way headers.
It is easiest if you already have a shield to use as a template. Push the header pins on the already built shield and then push onto the PCB and solder. This helps keep them all straight and makes it easier to push into the DataDuino base.



Step: 8	Fit onto the DataDuino base
	This shield should easily fit onto the DataDuino base (and also other Arduino shaped bases).

Step: 9	Wire up to battery holders and fit into enclosure.
On the initial batch of PCBs the P1 BATT has been incorrectly marked with + and GND reversed. A sticker with the correct wiring has been put on all the PCBs, so follow that. A laser cut baseplate has been designed which holds 3 x D cell batteries, and the PCB spacers.	

Step: 10	Wire up the Anemometers & Wind Vane
	The anemometers are pulse output types, so do not matter polarity. The wind vane (if used) also does not matter about polarity. Power it up, set the time, date, reference and sample period and there you go!

Contact details:

This kit has been designed and produced by:

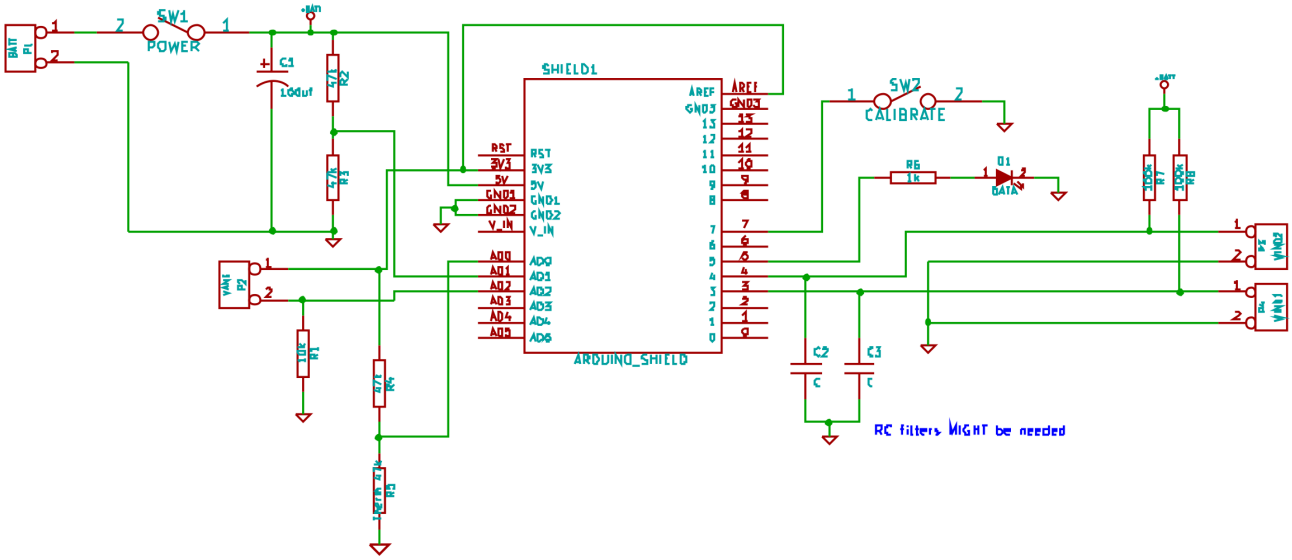
Renewable Energy Innovation.
info@re-innovation.co.uk
www.re-innovation.co.uk
Hopkinson Gallery
21 Station Street
Nottingham
NG7 6PD

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:

Circuit schematic:



PCB overview: