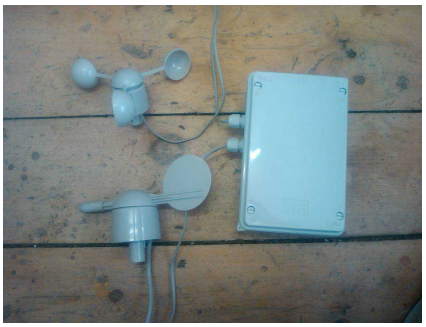
Wind Resource Logger Unit

Date:	30/07/14	Version:	1.0	By:	Matt Little



These are instructions to put together a stand-alone remote wind resource logging system.
The unit is based upon the DataDuino (an Arduino based data logger) and a simple Wind Logger Shield.
It is designed to take inputs from two anemometers, a wind vane. It also records temperature and battery voltage. Data can be recorded at rates from 1 second to 99999 seconds. Generally 600 seconds (10 minutes) is used for wind speed measurements.

Please note that this kit is a work in progress – feedback is very welcome. Work on the Arduino code and data manipulation is in progress – please get involved.

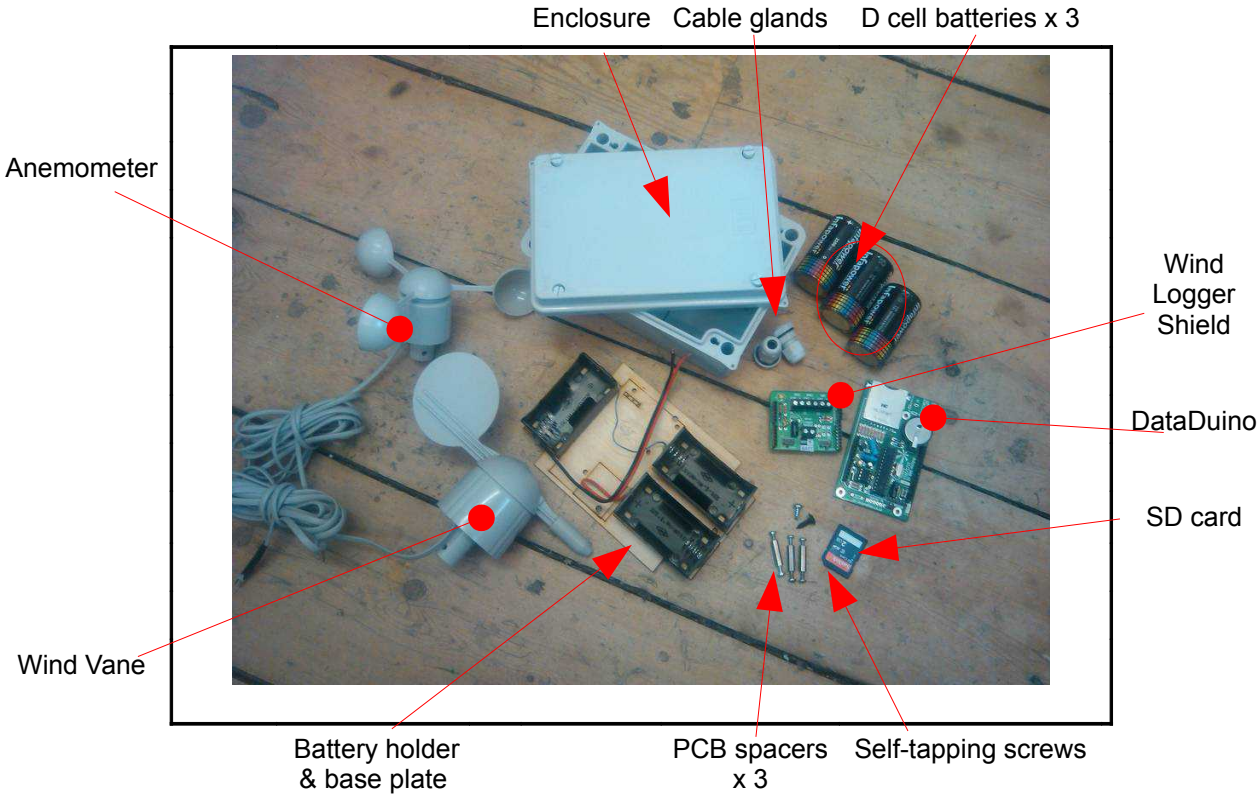
This kit assumes knowledge of the Arduino IDE.

Note: These instructions assume you have:

- *a DataDuino*
- *a Wind Logger Shield*

You will also need an FTDI USB to serial cable for programming and an SD card for data storage.

Parts included:



You will also need (not supplied):

- 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:

- 3mm flat headed screwdriver
- 5mm flat headed screwdriver
- No 1. Posidrive screwdriver
- Wire cutters/strippers
- Pliers

Instructions:

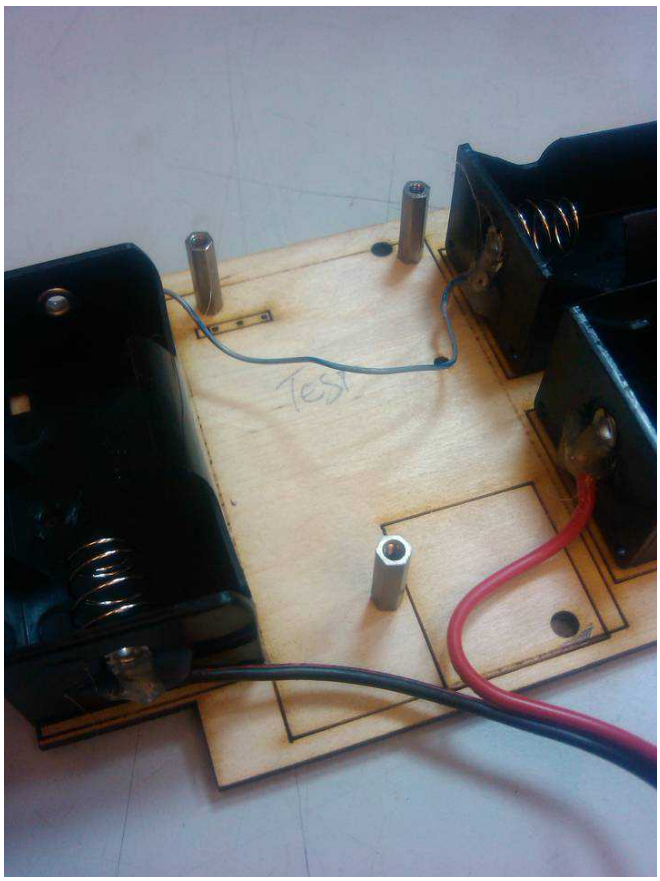
Step: 1	Build the DataDuino kit
Follow the instructions given with the DataDuino **APART FROM:** • *Do NOT use R1, R14 or LED D1, LED D5.* • *Do NOT use P1 power connector* • *Lay C1 Capacitor flat when soldering.* • *Add the Arduino Shield Headers (included).* If possible, follow the calibration routine given in the DataDuino instructions.	

Step: 2	Build the Wind Logger Shield
	Follow the instructions given.

Step: 3	Fit the PCB stand-offs

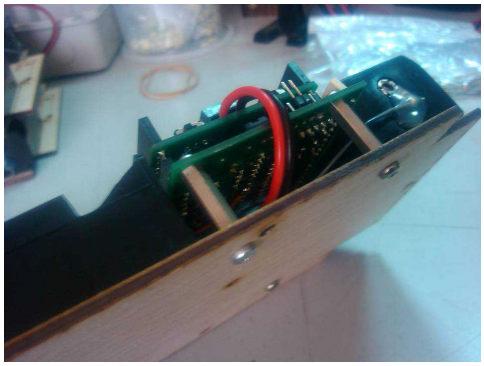
The three D cell battery holders are already fixed to a laser cut base plate.

Using the three PCB stand-offs (these may be metal or plastic), fit them to the base plate through the 3 smaller cut-out holes. These use a 3mm screw through the base plate.



Step: 4	Fit the DataDuino PCB to the stand-offs

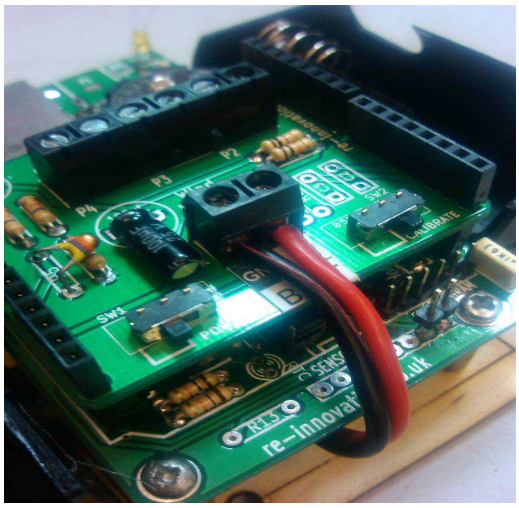
Using three 3mm screws fit the DataDuino PCB to the PCB stand offs. The laser etched pattern will show which direction the PCB will fit.



Step: 5	Fit the Wind Logger Shield PCB

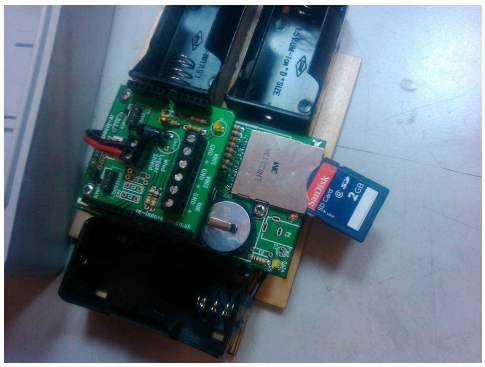
The wind logger shield fits onto the DataDuino using a number of header pins. Carefully fit this to the DataDuino ensuring all the pins are aligned.

Step: 6	Wire up the power



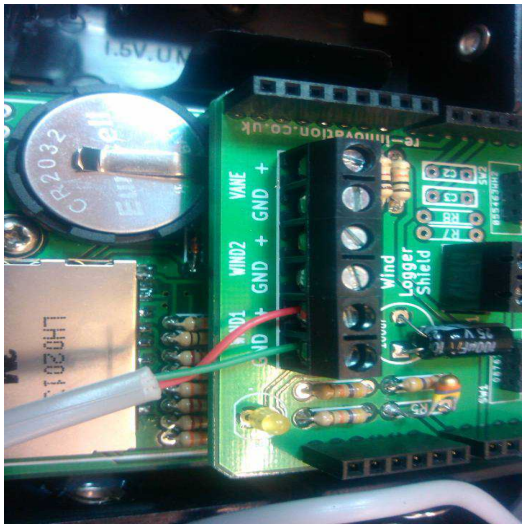
The black/red power lead from the 3 x D cell battery holders needs to be stripped (around 5mm of insulation taken off).
This can then be screwed into the 2 way power terminal block (P1).

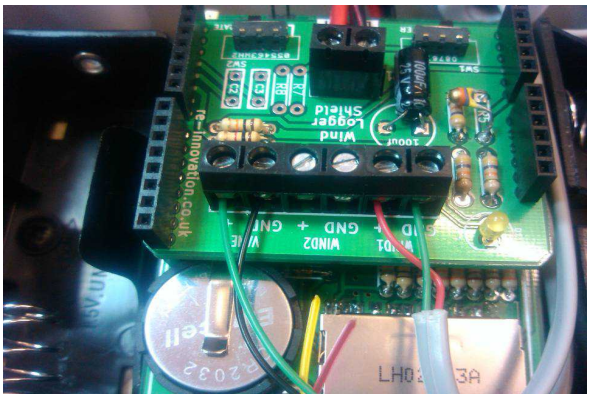
Step: 7	Add the cable glands
These fit in the pre-drilled holes in the enclosure. Ensure they are well tightened up.	

Step: 8	Insert SD card
	This is a push to click in/push to click out type SD card holder.

Step: 9	Fit base plate into enclosure
The wooden base plate is held in the enclosure with two self-tapping screws. One has a wide flat head and goes through the hole in the battery holder, the other has a narrower head and goes in-between the two battery holders.	

Step: 10	Wire in Anemometer (x2) and Wind Vane





The cables run through the cable gland.
You will need to cut off the attached connector for the anemometer and wind vane.

The anemometer has a red and green cable – strip back and screw into the Wind 1/Wind 2 terminal blocks. Polarity does not matter.

The wind vanes has four wires. You only need the black and the green cables. Screw into the Vane terminal. Polarity does not matter.

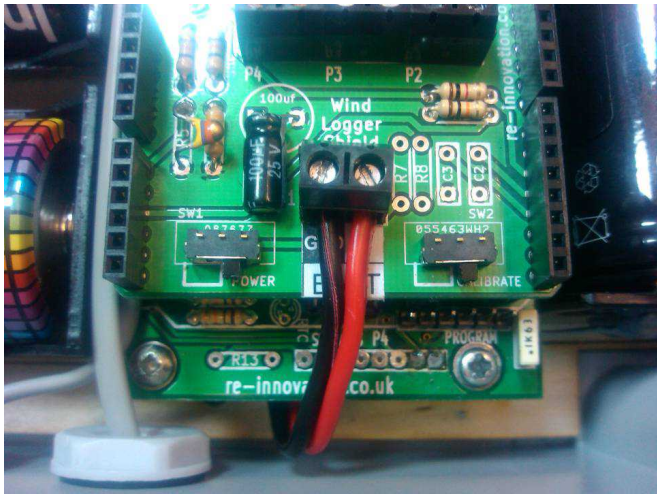
Step: 11	Test using the FTDI cable

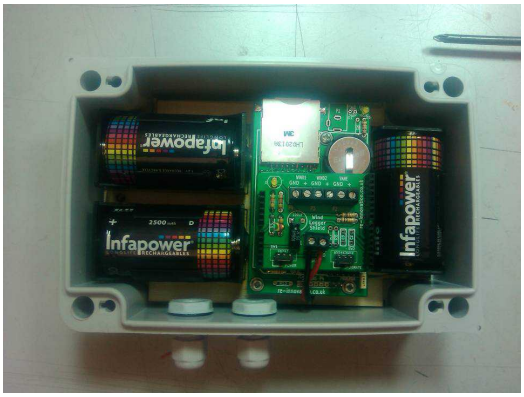
Do NOT insert batteries.
Set the Calibrate switch to ON (pushed towards the BATT terminal).
Plug in the FTDI cable.

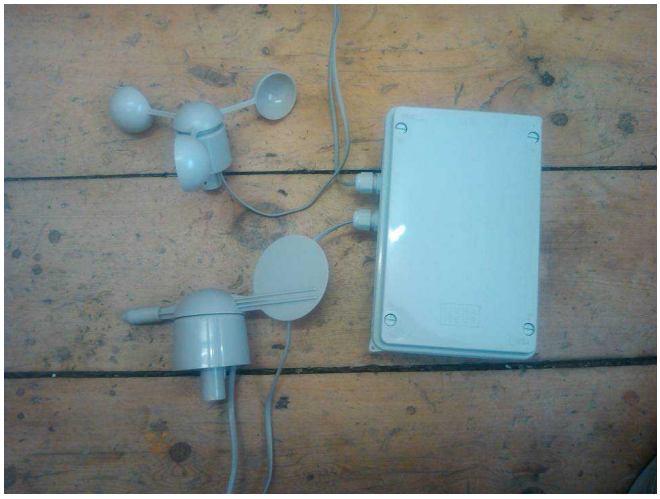
With a baud rate of 115200 you should see the word 'calibrate' on the serial terminal of the Arduino IDE.
Check the DataDuino instructions for more information.

Set the Date, Time, reference number and the sample period.

Switch Calibrate OFF (push towards the header pins on the side).
The LED should flash once every sample period.



Step: 12	Place in D cell batteries and switch ON
	Remove the FTDI cable. Ensure correct polarity of the batteries. Power ON position is pushed towards the BATT connector

Step: 13	Install Wind Vane and Anemometer
Ensure that the wind vane and anemometer are installed at a good height (if possible at the hub height of the wind turbine). Ensure the anemometer height is recorded. They must be installed level – use a spirit level to check this. The wind vane must be correctly oriented. Use a compass and the magnetic declination angle of the location to set north. (*** This is a work in progress ***). The anemometer frequency to wind speed coefficient is **0.7m/s per Hz**. These anemometers are **NOT** calibrated.	

Contact details:

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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.