

# Construction of a 6-channel data logger

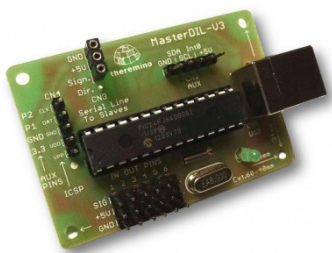
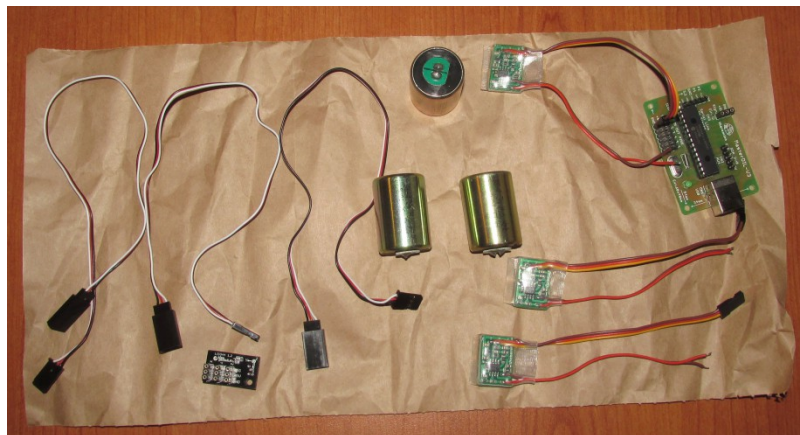
## DOLFRANG Project

### Prototype 5 - open source

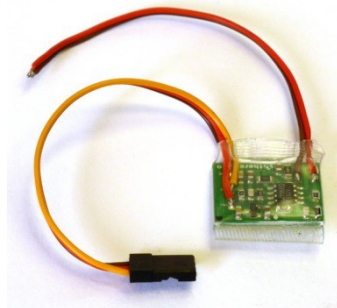
This report describes the various steps of the construction of a data logger for micro tremors as indicated in <http://comunitadigeologia.blogspot.it/2015/01/prototipo-5-hvsr-microtremor-free.html> of 17.01.2015.

Thanks to: **Angelo Dolmetta** for his work and for the passion that he transmit through his blog; **Theremino developers** for their high quality Open Source system.

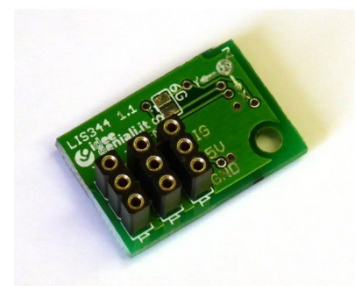
#### 1 - MATERIALS



1 Theremino master V3



3 Theremino GeoPreamp



1 accelerometer LIS344 1.3



3 geophones 4.5 Hz (one vertical, two horizontal)



connection cables



1 box FAEG 14cm x 19cm x 7cm



Hardware: 1 carriage bolt, three bolts Ø8, 7 nuts, washers 13, 5 wood screws

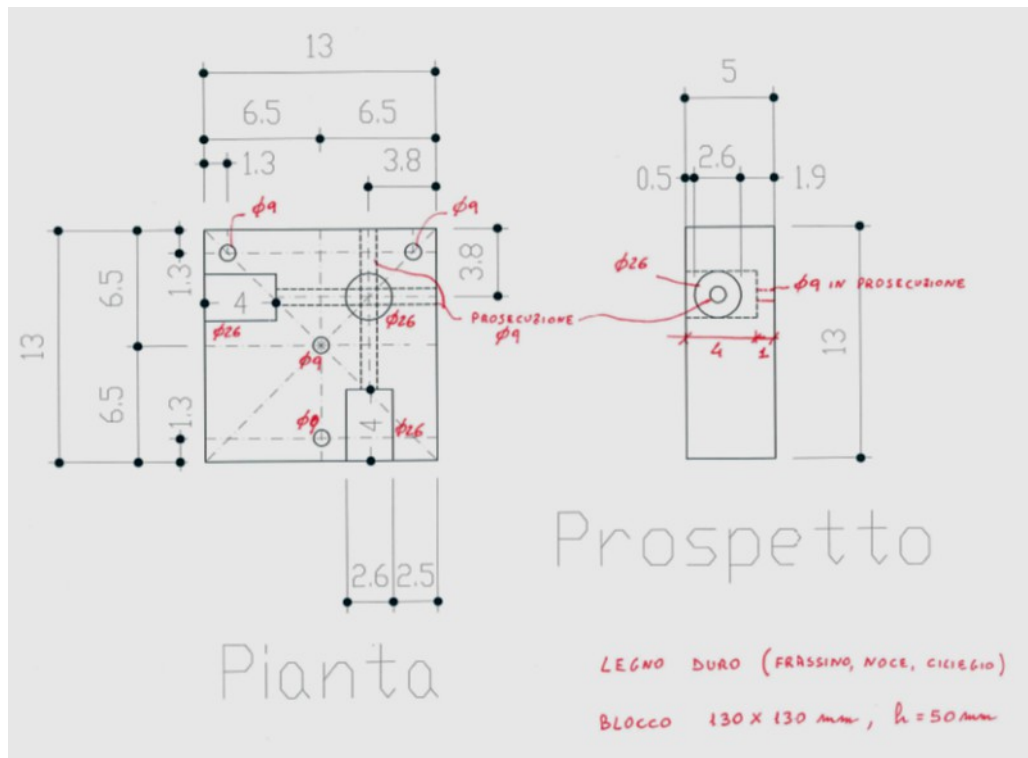


block of hard wood (such as durmast), Size 13cm x 13cm x 5cm

## 2 - ASSEMBLY

### 2.1 - PREPARATION OF THE CUBE

Definition of geometric pattern (dimensions in cm)



The holes to allow easy retrieval of the geophones are included in the design, the necessary machining are executed with the cutter and tip  $\varnothing 26\text{mm}$   $\varnothing 9\text{mm}$



The weight of the wood block is equal to 580g.



Even the protection box FAEG requires machining. Being a component for electrical installations it presents internal parts that are useful for example to fix the cables, while in our case, it is better to remove these internal parts. This work can be done with a Dremel and a cutting disk.



Then drill the holes for the bolts

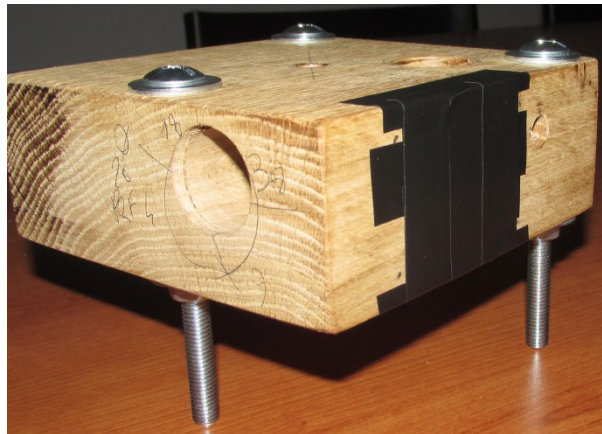


Now it is time to insert the three bolts, fix them with nuts and washers and tighten them strongly.

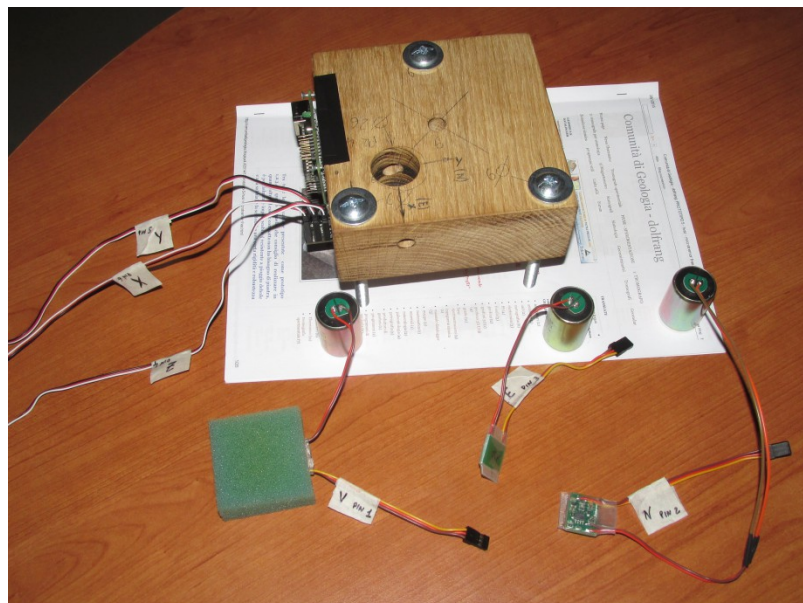


## 2.2 - ELECTRONIC PART

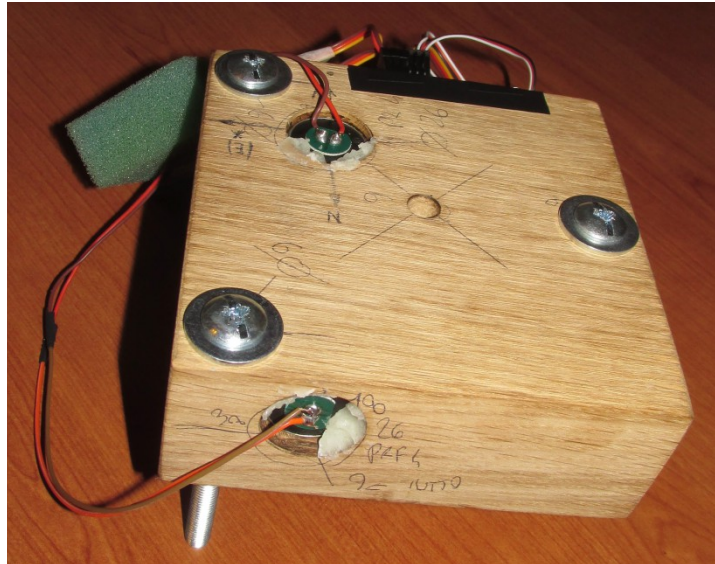
The positioning area of the Theremino is to be screened with triple layer of insulating tape



### Connections of the geophones and GeoPreamplifier and position of the LIS344 accelerometer



Put a thin layer of paraffin wax (the one used to protect a known cheese and heated for a few seconds in a microwave oven) on the bottom of the geophones, put the geophones in their stand and cover them with the same wax



## 2.3 - CONCLUSION

Place the wooden block in position and fix it with the center bolt. Put some pieces of sponge in the free space in the internal side of the box in order to limit micro-vibrations of the connecting wires. The following image shows the inside of the box. Note the USB cable connecting the Theremino through hole drilled in the side wall.





The cover has to be shielded with foil attached with double-sided adhesive



Remember to place the sponge onto the entire surface, always secured with adhesive.

Then finish the equipment by fixing the cover with 4 screws. The final weight of the unit is 1451g.



In the image below you can see the data logger along with all accessories: 2 types of threaded inserts, additional bolts, 5m extension cable.



Many examples of data acquisition are shown on the blog of geology :  
<http://comunitadigeologia.blogspot.it/>

I called this device "Hear Our Earth", because I think that we must strive to listen to the nature that surrounds us, because we still have much to learn.

Thank you for your attention.