

The root directory for PhysLoad on the Qosain cloud is:

[Type B / PhysLoad / Machining Packages /](#)

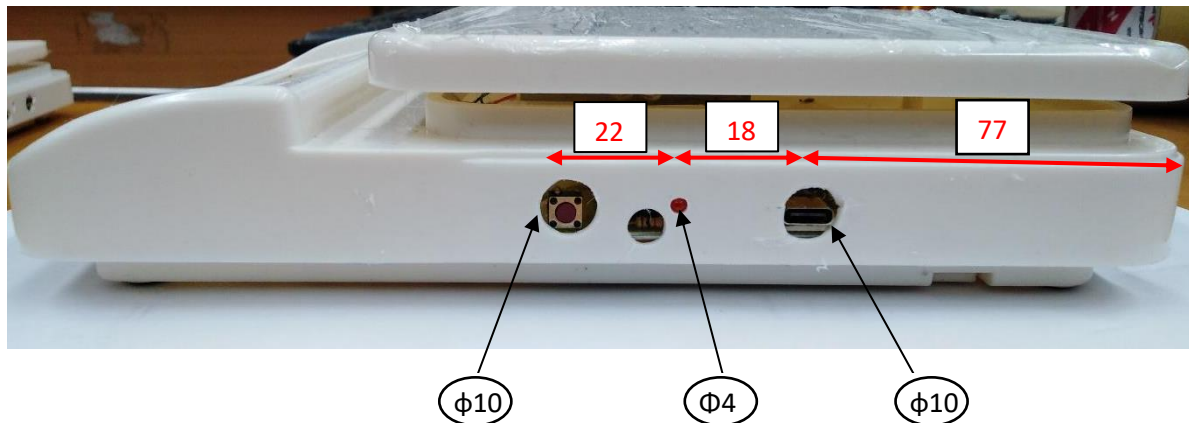
Mechanical:

The loadcell of range 5-7 Kg with casing is bought from the market from **the following supplier:**

It will look like:



On the side of the casing (as in bellow photograph), 3 holes are to be drilled. The positions and sizes of all 3 holes are given bellow (all values are in **mm**).



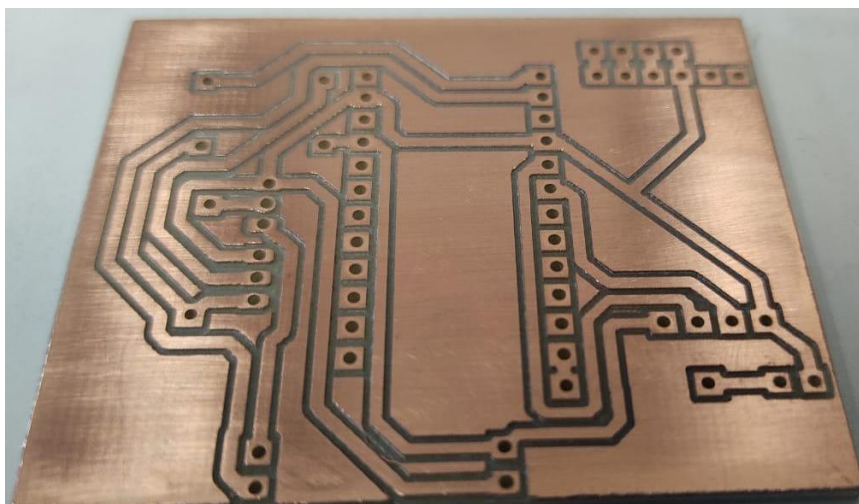
Electrical:

PCB Routing:

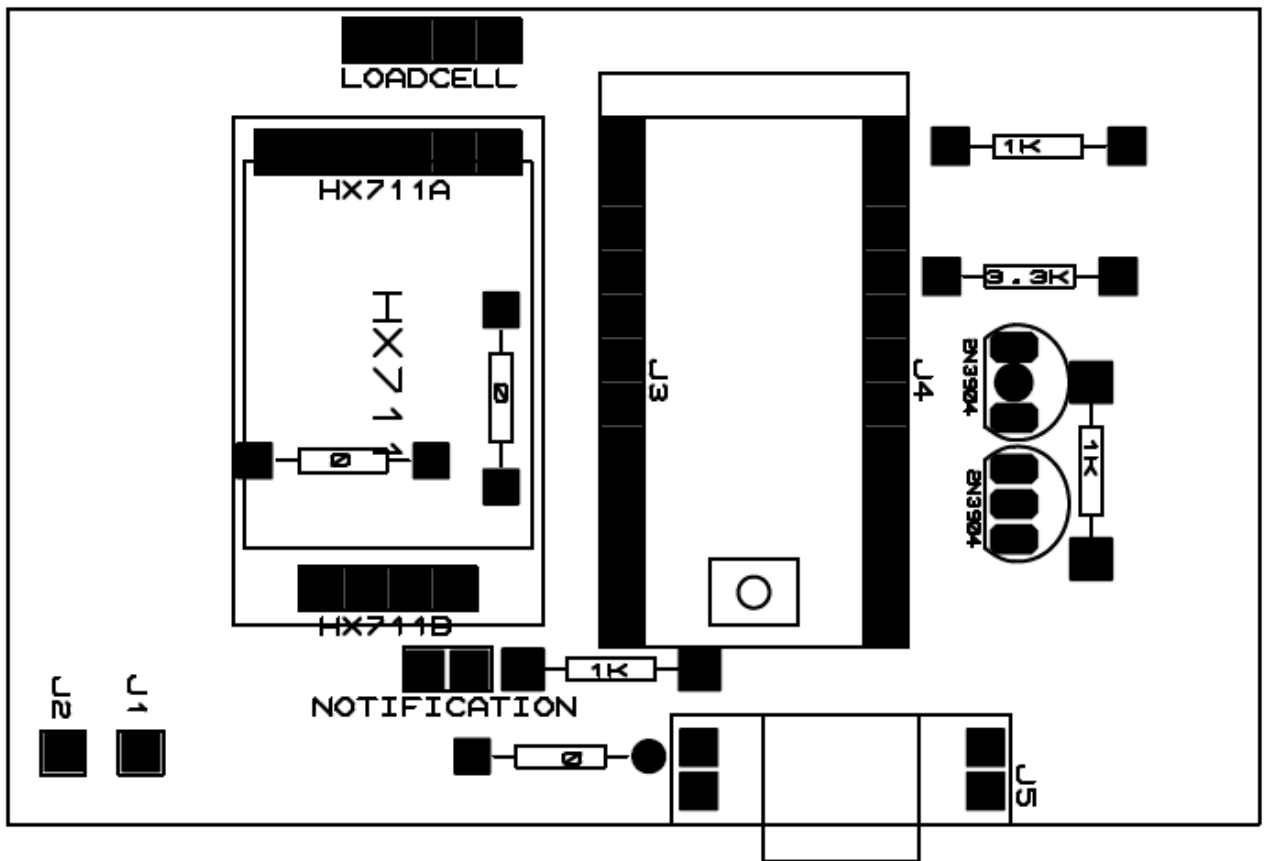
All these router files are located at [...Minimal / Electrical](#) directory and the proteus project file is located at [...Source / Electrical](#). Following is the list of router files for PhysLoad:

File name	File description	No of PCBs in each file
PhysLoad_PCB_Mill_x10.plt	Mill file for PCB router	10
PhysLoad_PCB_Drill_1mm_x10.DRL	1mm Drill file for PCB router	
PhysLoad_PCB_Edge_x10.plt	Edge file for PCB router	

After leaving the PCB router, it's necessary to rub these PCBs with sandpaper (**P800** grit size will be fine). Then it will look like:



For the component placement, refer to the image bellow,

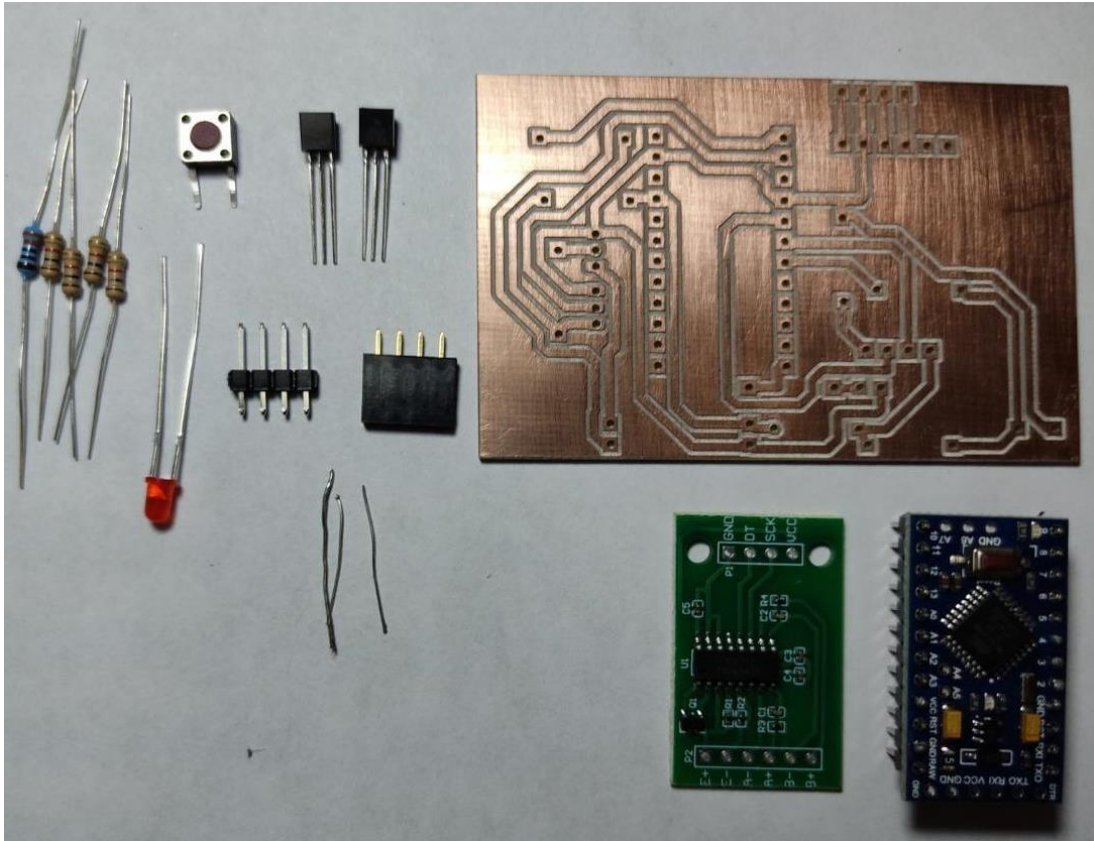


The list of all the electrical components for PhysLoad is provided in **Appendix-A**.

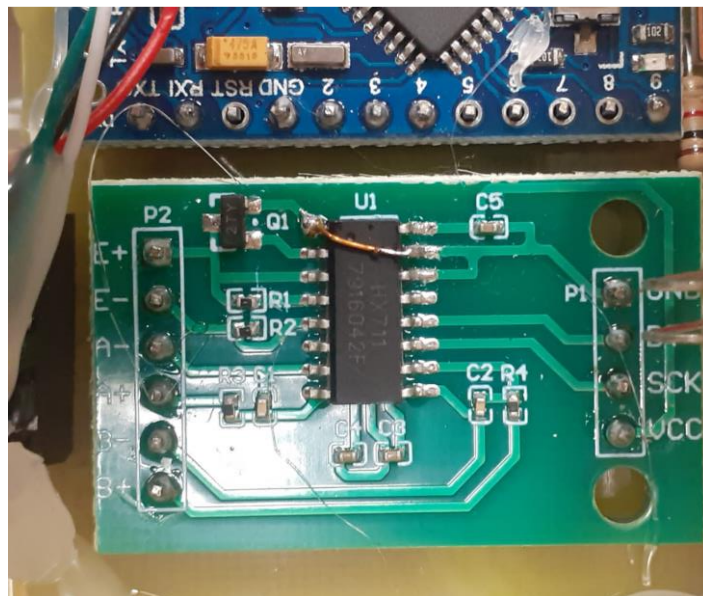
Soldering:

Here you can see all the components that are to be soldered on the PhysLoad PCB:

Note that the 2 legs of the button are cut, and in the next photograph you can see that a header is attached to this button to support mechanically.

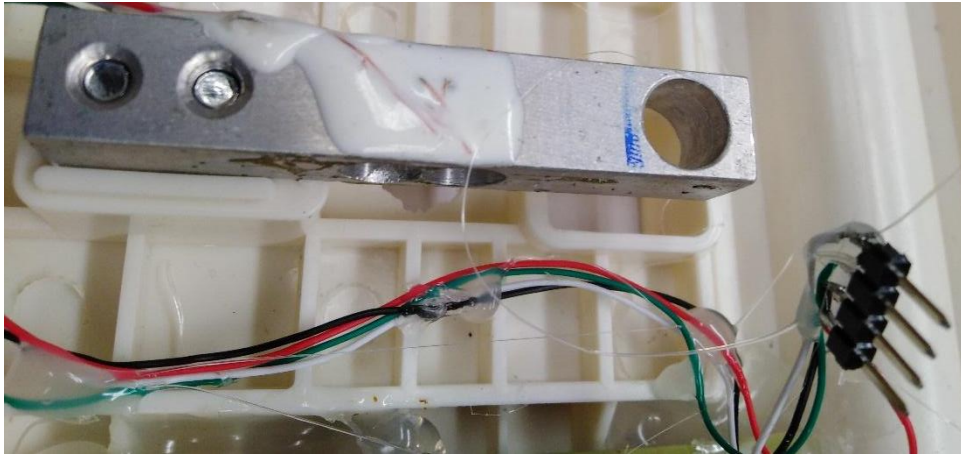


After all the components are soldered, the PCBs will look like:



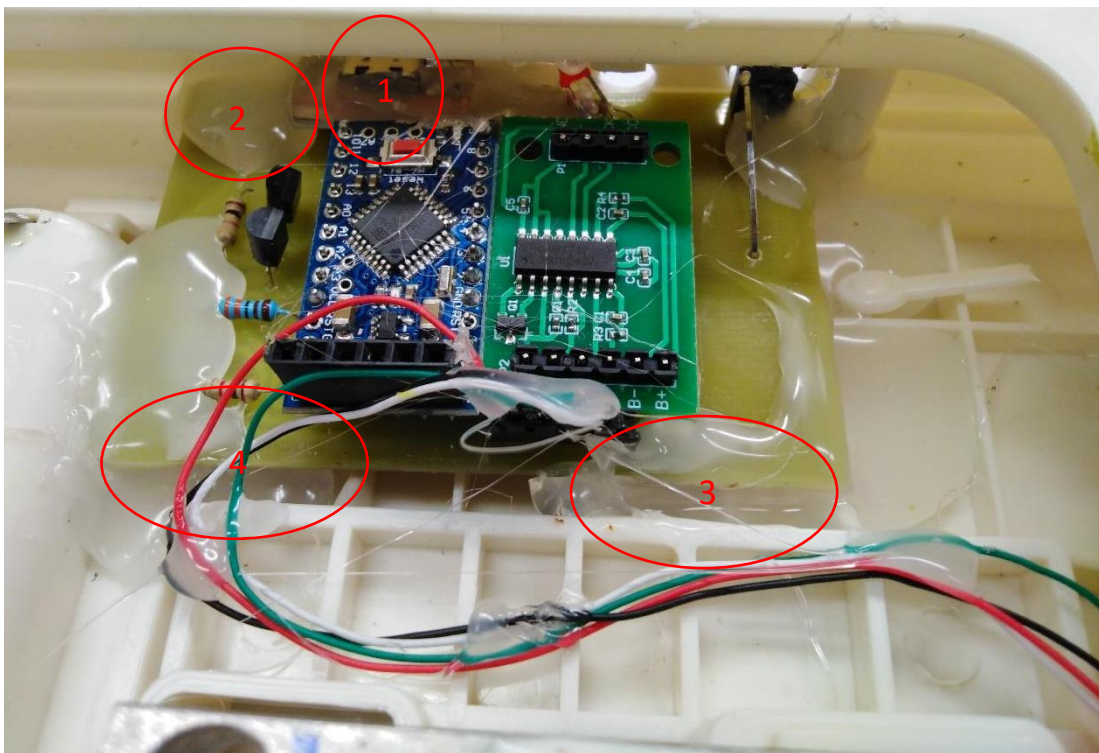
Note: The IC (H X 711) is used here, where the Pin 15 is connected to Vcc pin (For identifying pinouts of IC, see its data sheet).

The box will have a load cell already placed inside, with these 4 wires attached to it. Solder a 4-pin male header to these wires:

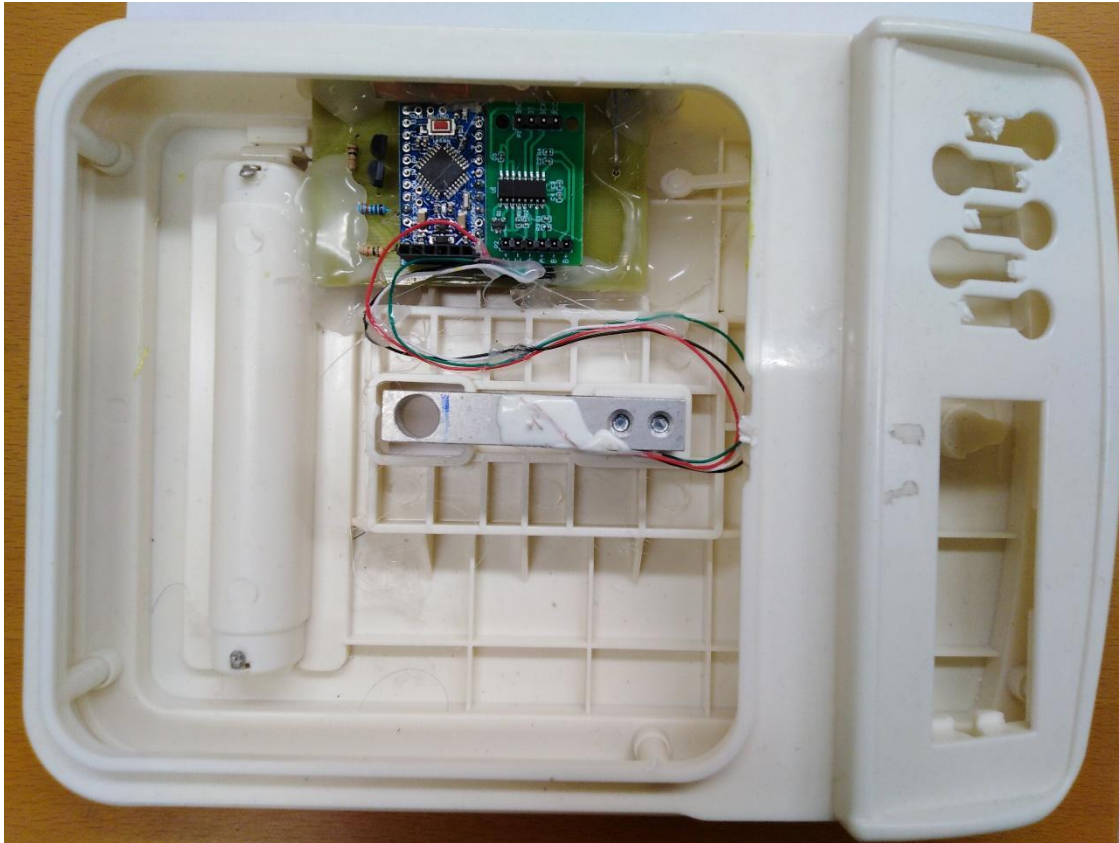


Assembly:

Put the PCB inside the casing and insert the male header of the loadcell into the female header on the PCB.



Apply silicon on all the points mentioned in the above picture. The importance of applying silicon on each point is indicated by the number mentioned.



Now before putting the top plate on, the firmware installation, calibration and testing should be done.

Firmware installation:

1. Plug in the FTDI USB in the Arduino header.
2. Connect the FTDI USB to your desktop/laptop.
3. Open PhysLogger Desktop and right click on any Logger and select **Open console on this device**.
4. **> flash physload**
5. Select the FTDI USB
6. Retry if fails
7. **> exit**

Calibration:

In order to calibrate the PhysLoad using PhysLogger console, follow these steps:

1. Connect the PhysLoad with the PhysLogger (any channel)
2. Connect the PhysLogger to the computer
3. Open PhysLogger Desktop and right click on **PhysLogger Gen2** and select **Open console on this device**.
4. **> list qs** (This must show a PhysLoad quantity at number 7 or higher.)

5. > **select q7** (whichever quantity you see in the list)
6. > **read**
7. > **read**
8. > **read** (Must read ~0 every time)
9. Put a known value weight. Typically, for a 2KG scale, a 1.75Kg load should be used.
10. > **read**
11. > **read**
12. > **read** (Must be in a tens or thousands only).
13. > **set grams 2000**
14. > **exit**
15. > **exit**
16. Press any key
17. Unplug and re-plug the main USB from the computer.

Testing:

1. PhysLogger Gen2
2. Go to **Templates > live plot**
3. Drag PhysLoad on to the plot
4. Apply the same testing load and verify.
5. Unplug the USB.
6. The calibration is complete. You can test it further with other weights

When **list qs** is typed and if it does not show the PhysLoad in the quantities list, then following could be the possible issues:

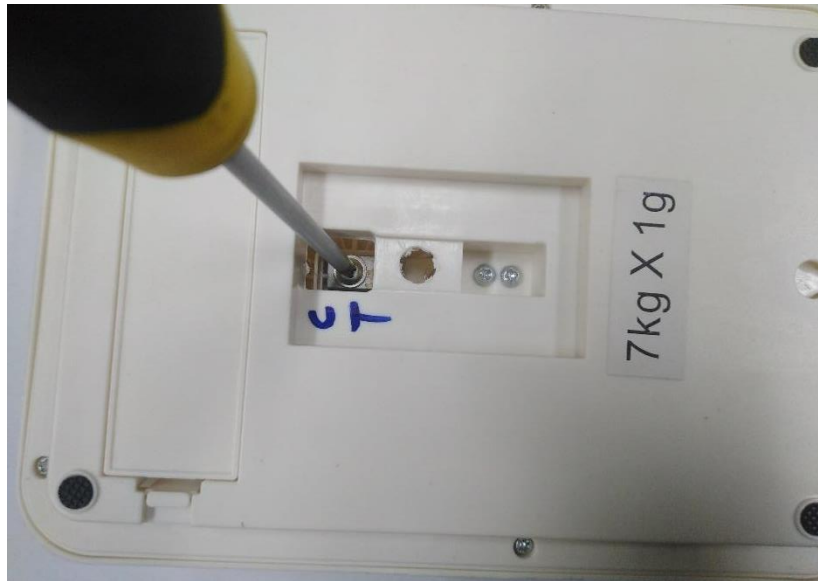
1. PhysInstrument cable is faulty
2. USB expansion is faulty
3. Firmware not installed

If Arduino power LED is not turned ON then following could be the errors:

1. PhysLogger detached
2. USB power surge
3. Unrecognized device

And all these errors indicate that there is some electrical shortage in the circuit.

Now put on the top plate on and tighten the screw properly:



Appendix-A:

Bill of Materials for PhysLoad (Electrical)		
Item name	Count	Cost (Rs)
1K Resistor	1	0.8
4.7K Resistor	1	0.8
3mm red LED	1	1
2N3904 Transistor	2	10
10K Variable Resistor POT	1	20
USB-C Expansion	1	25
FEMALE BANANA Connector	2	40
Load Cell and Casing	1	1700
PCB size for 12 PhysLoad PCBs	(238 x 144) mm	230

Total	1820
-------	------

Total cost for a PhysLoad unit	1820 Rs
---------------------------------------	----------------