Finalization of Frame for pneumatically Automated Xylophone

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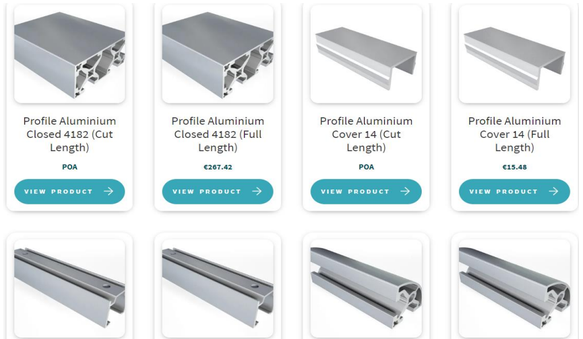
Aim of the Project

The Aim of the project is to build and test a housing for the pneumatically automated xylophone.

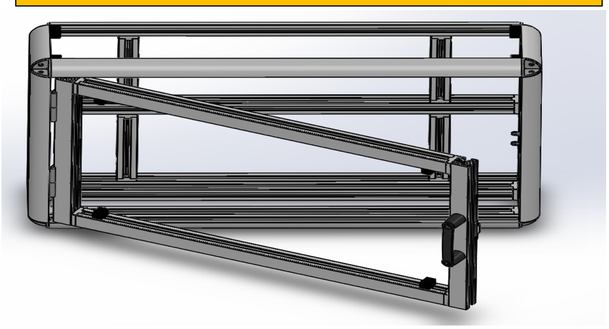
Material Choice

Material Choice – Extruded Aluminum



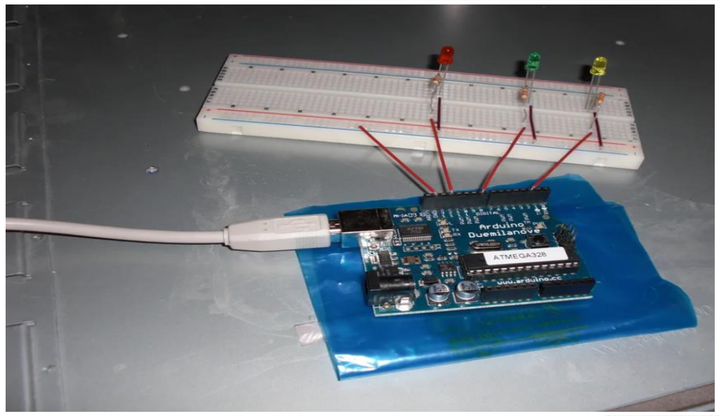
The main objective for choosing a material was to choose the least expensive material that supports the dependability and performance of the final product. Extruded Aluminium was chosen because it fits within the budget and is a great material for creating a frame.

Frame Design



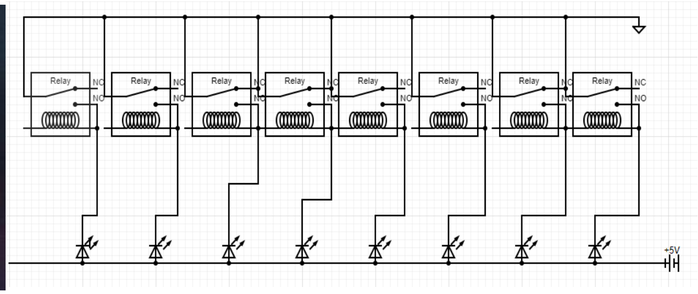
This Design was used as a baseline for building the housing. The design is made from Extruded Aluminum along with various other corner connecters, plastic panels, door handles and many more parts all ordered from Quantum 3.

Integrating LEDs

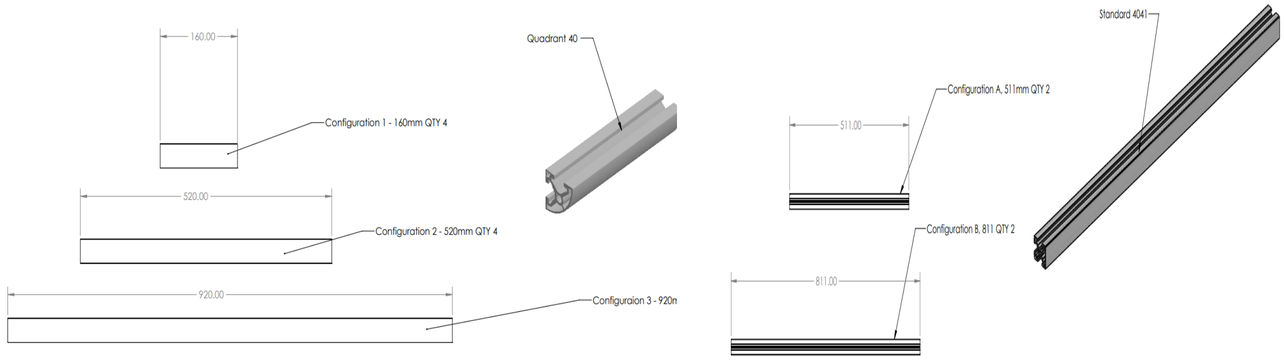


The original Idea was to connect each LED to the Arduino using a breadboard and some wiring making the LED turn on when a note is played, however even though this worked, the LEDs would only be shown on the bread board and could not be spread throughout the frame to create a more eye-catching look.

The LEDs would also be too small to even see.

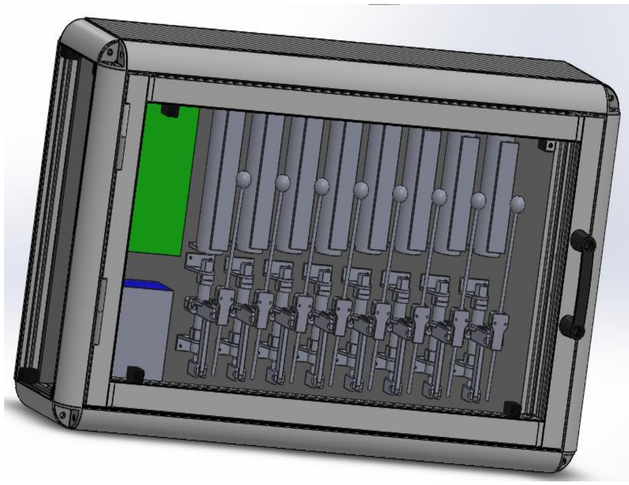


The final Idea was to get bigger LEDs and connect them to the PLC using banana connectors and a 5v USB plug. The LEDs are wired like the image above. They are connected to the positive side of the wiring in the plug and soldered together across the frame. The LEDs are then all connected to the negative side which is the PLC.



Each part of the frame was turned into a drawing. The drawings show all the different configurations for each part . These drawings were given to Quantum 3 to create a life-size model. Once the model had been created it was sent from Quantum 3, once all the pieces arrived the frame was then built.

Build



This image represents the final build of the Frame along with the Xylophone, PLC and Valve bank housed within. The xylophone can be accessed using the door. The frame is small enough to be carried around and placed wherever the user likes.

Conclusions

- The small LEDs on the breadboard don't create an eye-catching look for the frame.
- The bigger LEDs create a more simplistic view and work well turning on and off with the music.
- The Frame is made from mainly Extruded Aluminum along with various other materials.
- The PLC will be used as a ground source for all the LEDs.
- The 5v Plug is used to as a power source to turn on and off the LEDs.