Project Scope:
Team put together a tabletop elevator for students of MFGE 4395 to test if they correctly coded a PLC to run an elevator.

Requirements:
- Control Panel with a display of location of elevator
- At least 3 floors
- Must have a elevator housing that can store a cube sized: 3in³ and open/closed doors.

Tasks:
- Design of elevator
- Fabrication of elevator
- Electrical and Mechanical Operation
- Testing of elevator

Elevator Frame:

Description

Elevator Design
As displayed there is two types of materials used to make the frame and the housing of elevator box. The frame is made of 80/20 extruded aluminum which makes a durable, light weight frame that also looks good. For the panels and elevator housing the engineering team used clear acrylic sheet 0.080 thick, since it would be affordable and it achieved the purpose of holding light weight materials such as the winch and the 3x3x3 in³ cube.

How it works:
- Operator presses desired floor on the button panel which will send a signal to the 1/10 scaled down winch to either move the elevator up or down depending on what floor it is on. While the elevator is in operation the limit switches located on the frame will be activated once the elevator box reaches each floor and will know when to cut off power to the winch and the elevator will be at desired floor.

Mechanical specifications for open/close elevator door:
- One of the sponsor specifications was to have the elevator door open and close. In order to achieve that the team used a DC 12v motor that will be mounted on the acrylic plate on top with a gear and a tooth strip will move the door left to open and right to close the door.

Operation instructions

Control Panel with Buttons
Buttons on outside of elevator:
1. Up from 1st floor
2. Up from 2nd floor
3. Up from 3rd floor
4. Down from 2nd floor
5. Down from 3rd floor
6. Down from 4th floor
7. Emergency Button

Buttons inside the elevator
1. 1st floor
2. 2nd floor
3. 3rd floor
4. 4th floor
5. Open elevator
6. Close elevator

Above is the button control panel that consist of 13 illuminated buttons in which will light up when user activates.