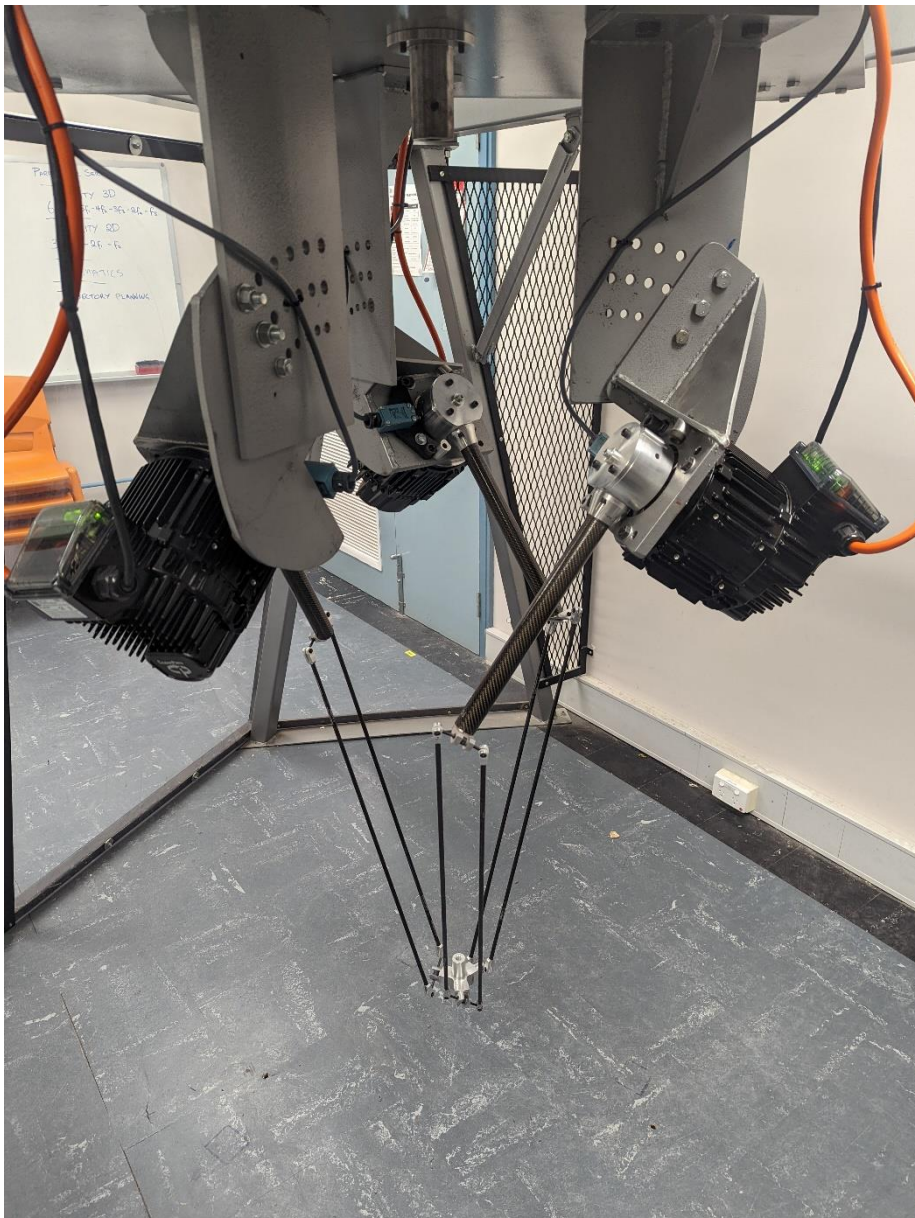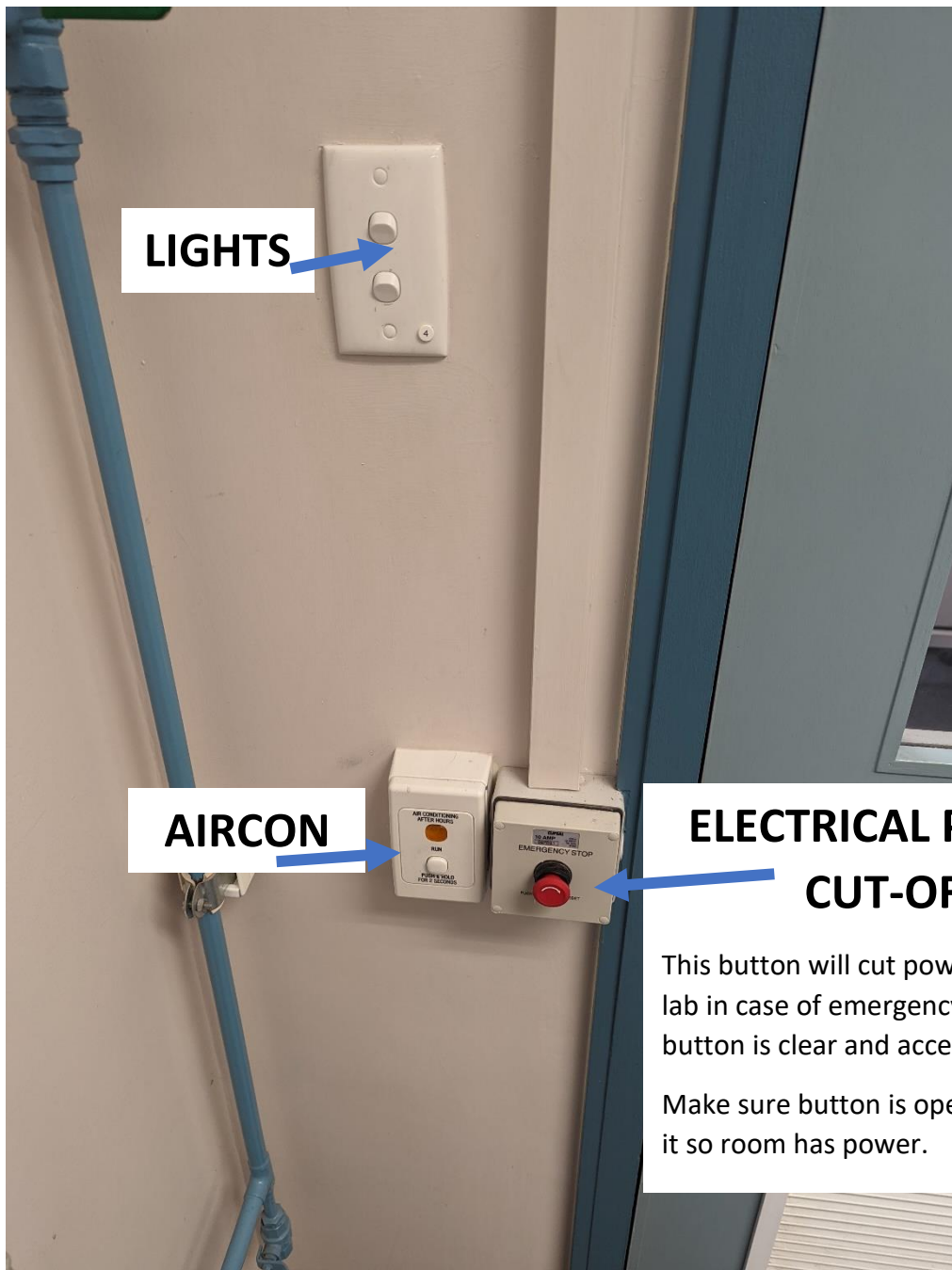# NEWAR 2.0

Usage/Overview Guide

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Jake Lorkin (jake@lorkin.cc)

Lab Room Setup

LIGHTS

AIRCON

ELECTRICAL POWER CUT-OFF

This button will cut power to whole lab in case of emergency, ensure button is clear and accessible.

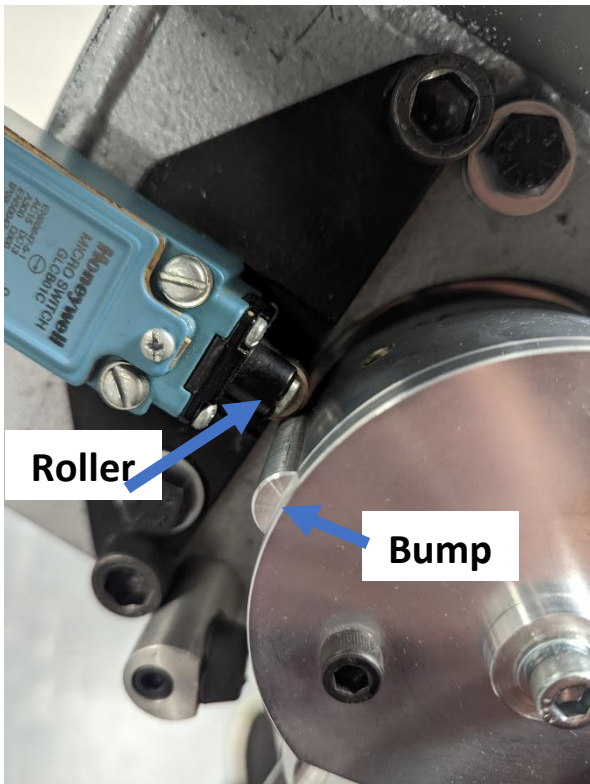Make sure button is open by twisting it so room has power.

POWER SWITCH

Power board for computer and robot, ensure red light is on. Check room E-Stop if not.
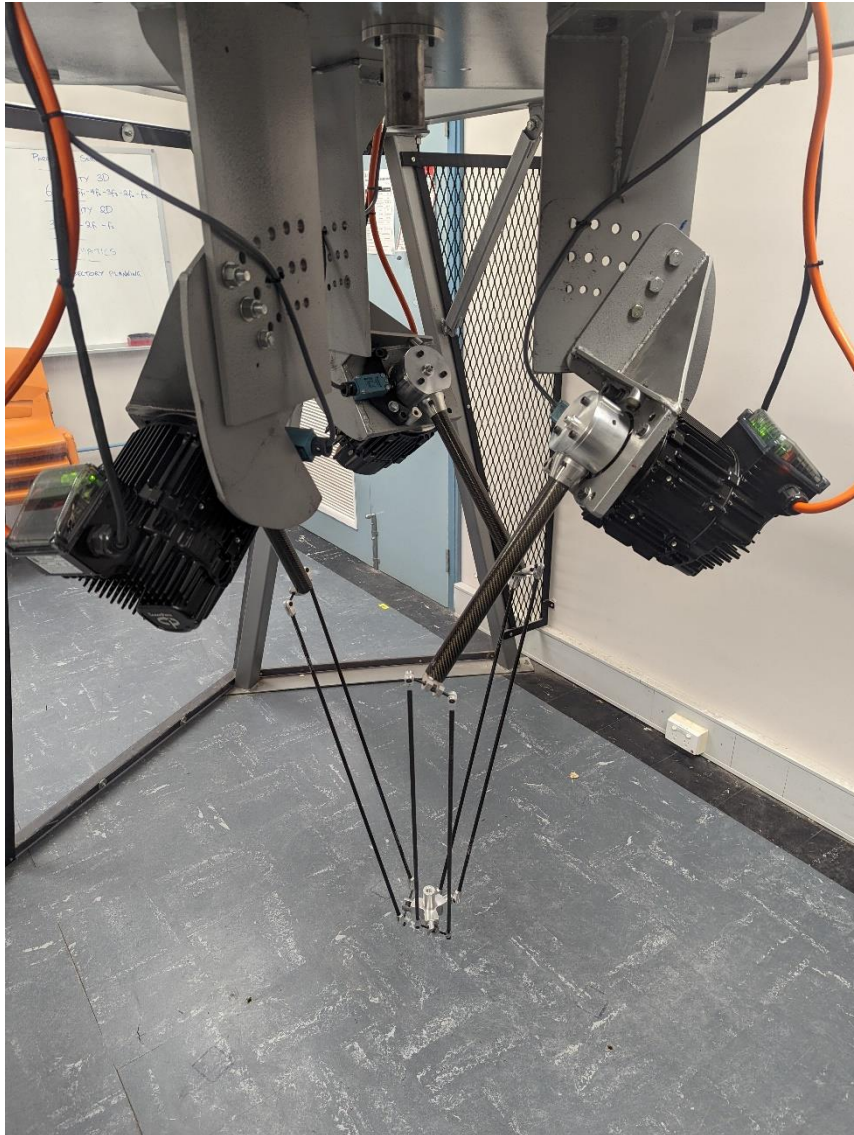
Robot Setup

- Close cage door, check door limit switch is properly closed.

- Check all 3 motor limit switches are in this position.
- The switch should 'click' when the motor moves to its end positions.
- Bump in motor coupler should be below limit switch roller.

Roller

Bump

Robot Setup

- Check nothing is obstructing robots' range of movement, and cage area is clear.

Power On

- Turn on motors by flicking motor power circuit breaker.
- Motors will energise and green LED's should be visible on each motor.
- Otherwise check control box is plugged in and has power from the wall.

Motor Power Circuit Breaker

Motor Power Indicator LED
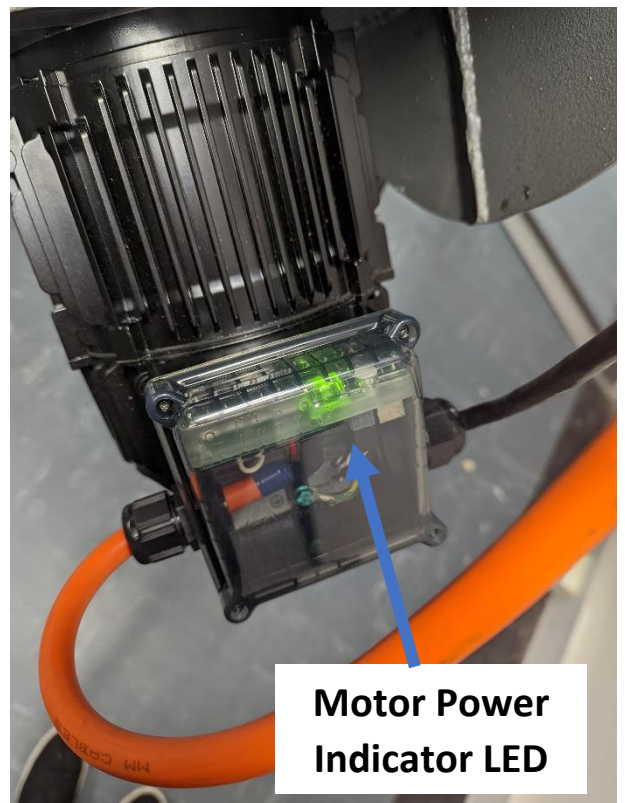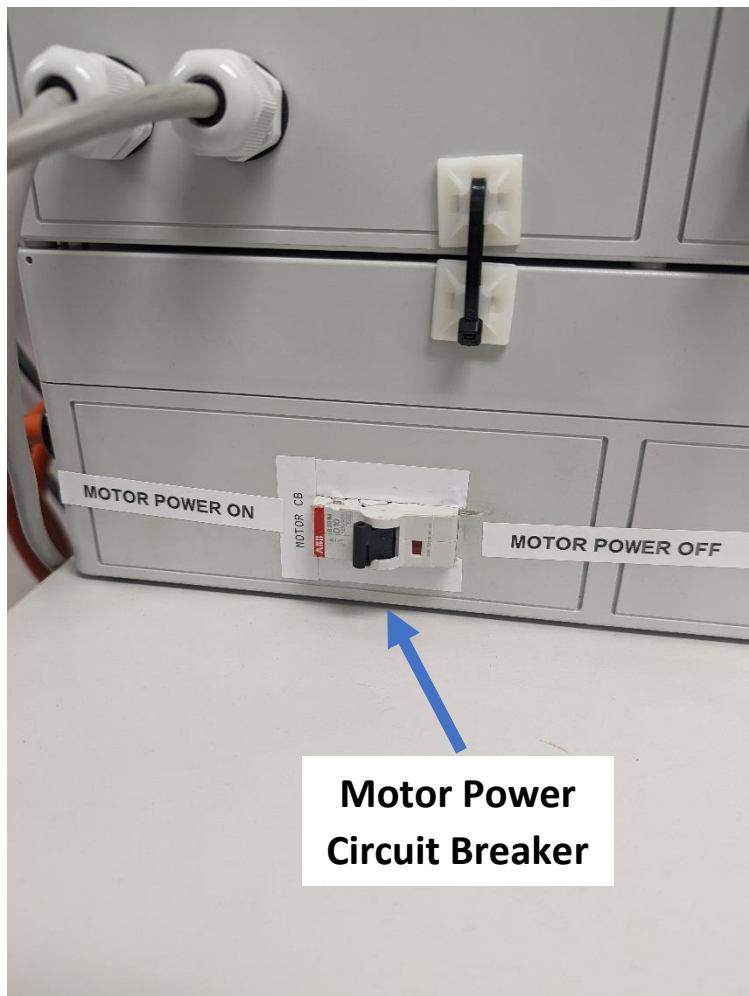
Power On

- Power on Control Box switch. Check control box e-stop is open.
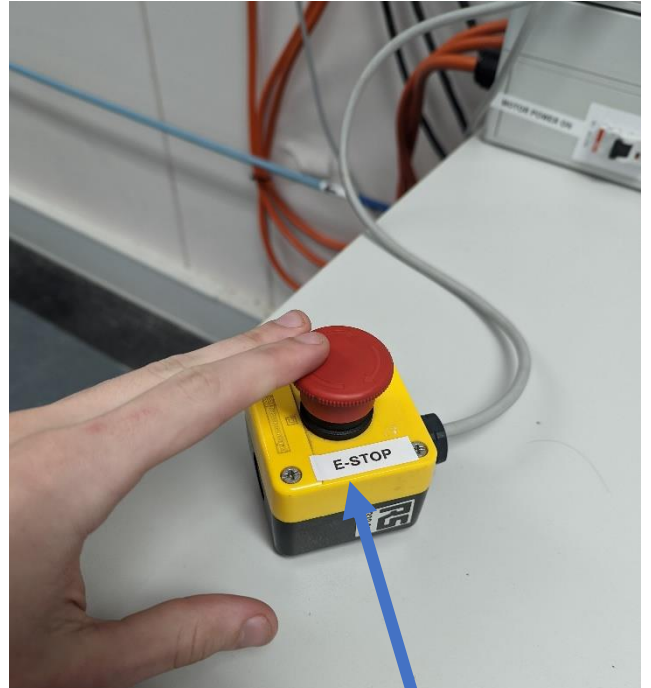
Control E-Stop

Disables motor movement, motors will also be disabled if cage door is opened.
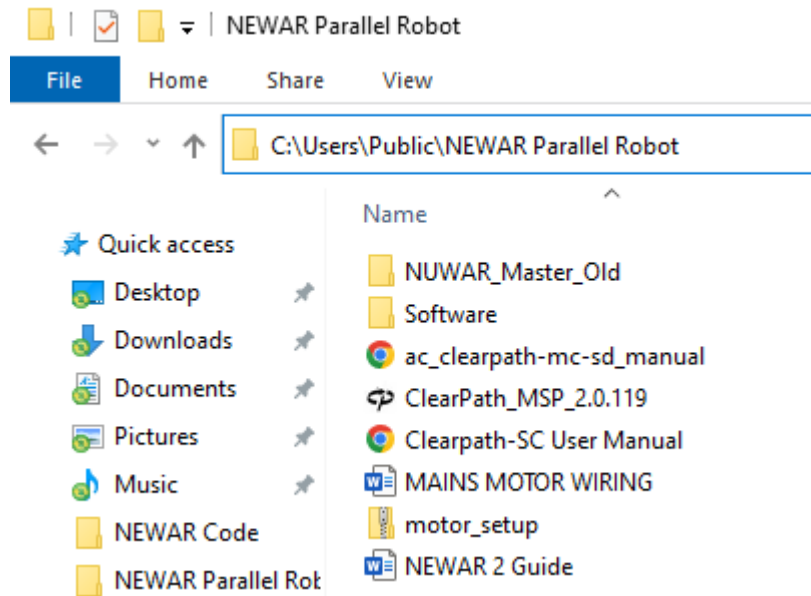

- Make sure control box is plugged into computer's USB port.
- Teknic ClearPath SC Hub should be visible on device manager.
- If not check all power connections and switches.
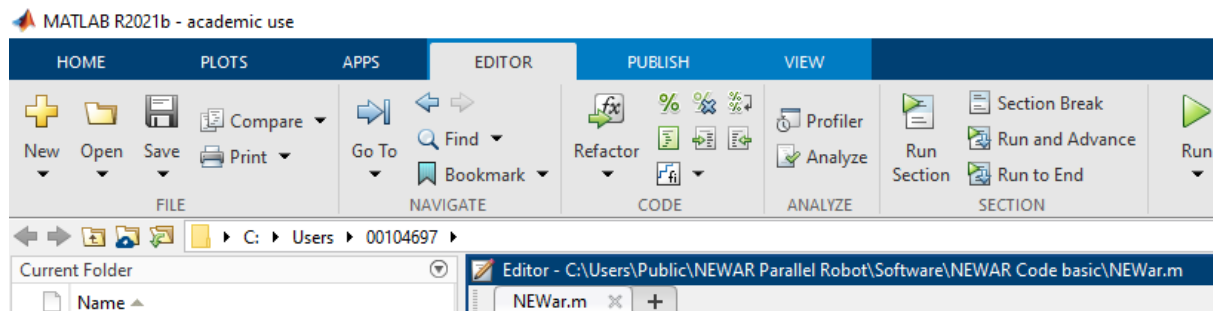- Ensure door switch is closed and E-Stop open.

Start Program- Basic

- Log into lab PC with staff or student account.
- All NEWAR files are saved locally under

C:\Users\Public\NEWAR Parallel Robot

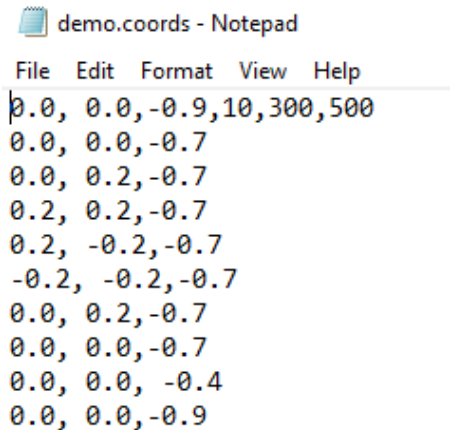- Run MATLAB and using the "Open" button open "NEWar.m"

- This line opens a '.coords' file that contains XYZ, coordinates and speed/acceleration info for the robot to follow

```
fid = fopen('demo.coords');
textLine = fgets(fid); % Read first line.
```

Start Program - Basic

- A '.coords' file is a csv file that follows the structure

(X coord), (Y coord), (Z coord), (accel)*, (vel)*, (delay)*

- * - means optional and all speed values are in RPM/s, delay is in milliseconds and coords in meters with the steel pole at the top being the origin.
- Delay is the minimum time a move will take, so once a move is done the remaining time will be waiting.
- optional parameters carry over onto previous lines until overwritten.

demo.coords - Notepad

File   Edit   Format   View   Help

```
0.0, 0.0,-0.9,10,300,500
0.0, 0.0,-0.7
0.0, 0.2,-0.7
0.2, 0.2,-0.7
0.2, -0.2,-0.7
-0.2, -0.2,-0.7
0.0, 0.2,-0.7
0.0, 0.0,-0.7
0.0, 0.0, -0.4
0.0, 0.0,-0.9
```

- Save your coordinate file and run the MATLAB program.
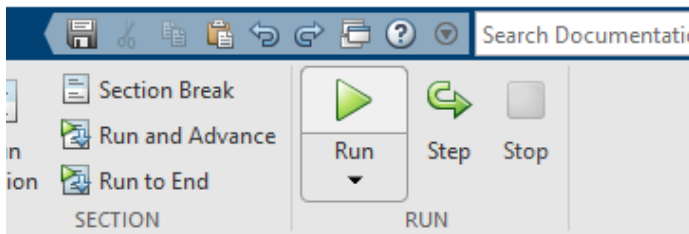
- Motors should home, make a few clicking noises and then start the program.

Max Values:

- Motor Acceleration: 2000 RPM/s/s
- Motor Velocity: 500 RPM/s
- X: (0.7, -0.7). Y: (0.7, -0.7). Z: (-0.4, -0.7)