

Flipping an object with two robots

Making instructions



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Laser cutting

First of all, to make the flipping demonstrator, you need to make all the wood pieces to fasten all the different parts of the demonstrator and to set the robots in their environment.

For these wood pieces, you will need a wood plank of 5 mm of thickness quite rigid, plywood, for example. Then, you will need to cut these pieces with a laser cutting machine. All cutting files are made for a machine of dimensions 600x300 mm, as the TROTEC Speedy 100 (<https://www.troteclaser.com/fr/machines-laser/machines-gravure-laser-speedy/>).

Three types of pieces are necessary:

- 2 niryo stand, to fasten the robots

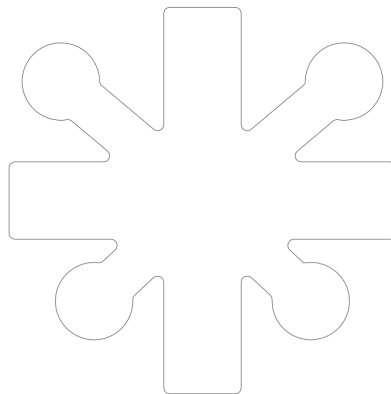


figure 1: niryo_stand.dxf

dimensions: 250x250 mm

- 1 long straight block, to link the two robots

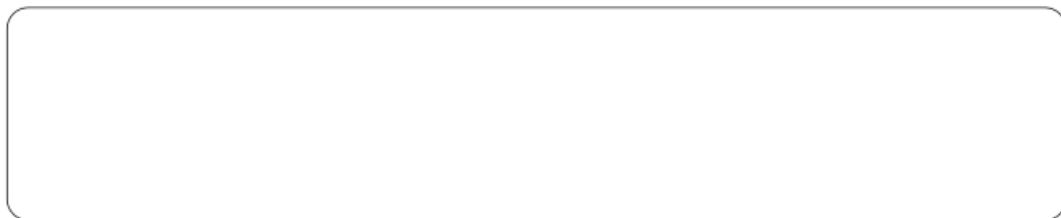


figure 2: straight_block(long).dxf

dimensions: 250x50 mm

- 2 piece stand

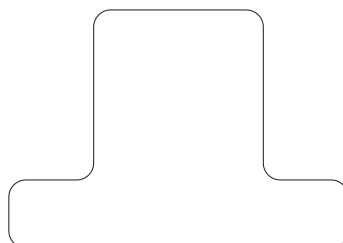


figure 3: logo_niryo_stand.dxf

dimensions: 100x70 mm

To cut these pieces you will need one plank of 600x300 mm.

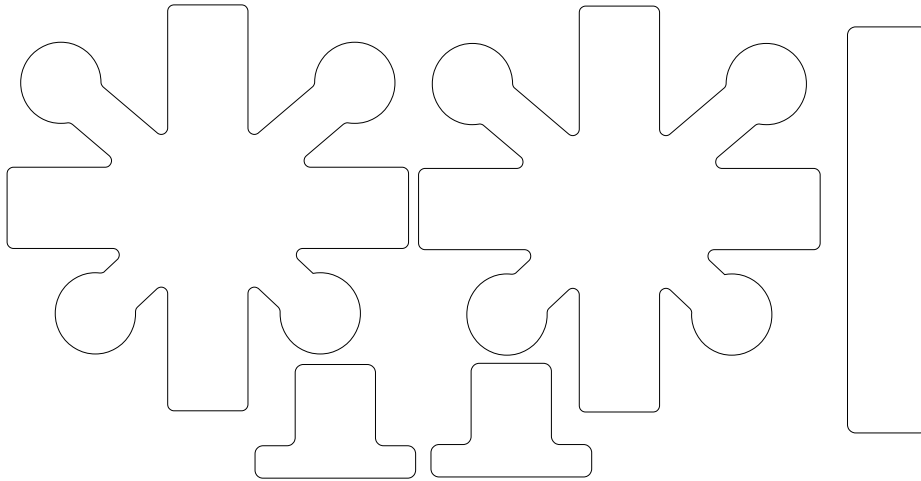


figure 4: flipping.svg

dimensions: 600x300 mm

3D printing

You will need to print different pieces in 3D.

- Control box
 - upper control box

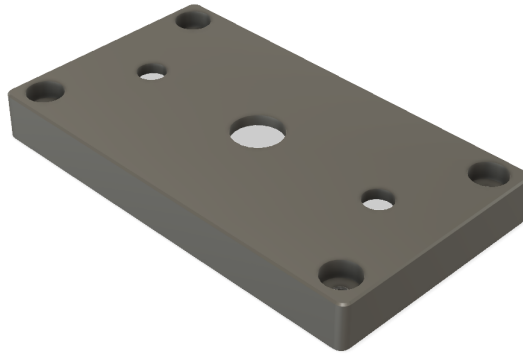


figure 5: upper_control_box.stl

dimensions: 116x66x13 mm

- bottom control box

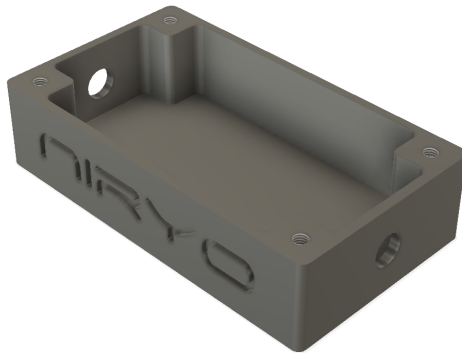


figure 6: bottom_control_box.stl

dimensions: 116x66x28 mm

- 2 right magnet fastener

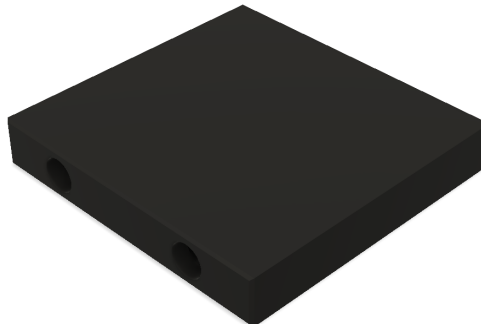


figure 7: magnet_fastener_right.stl

dimensions: 53x55x9 mm

- 2 left magnet fastener

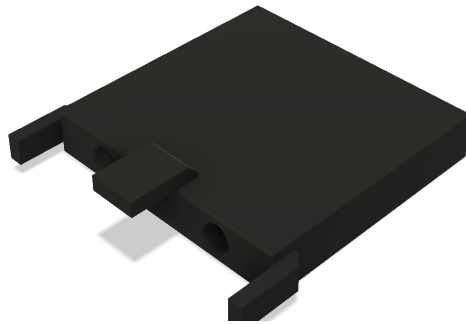


figure 8: magnet_fastener_left.stl

dimensions: 63x61x12 mm

All 3D pieces need to be printed with these printer characteristics:

- Nozzle size: 0.4 mm
- Layer thickness: 0.2 mm
- Filling: 15/20 %

Demonstrator assembly

When all the pieces are cur or printed, you can start the assembly of the demonstrator.

Begin by introducing the little round magnet in the hole provided for this purpose in the pieces “magnet_fastener_right” and “magnet_fastener_left”.

Then, you can assemble the different pieces of the demonstrator following this scheme:

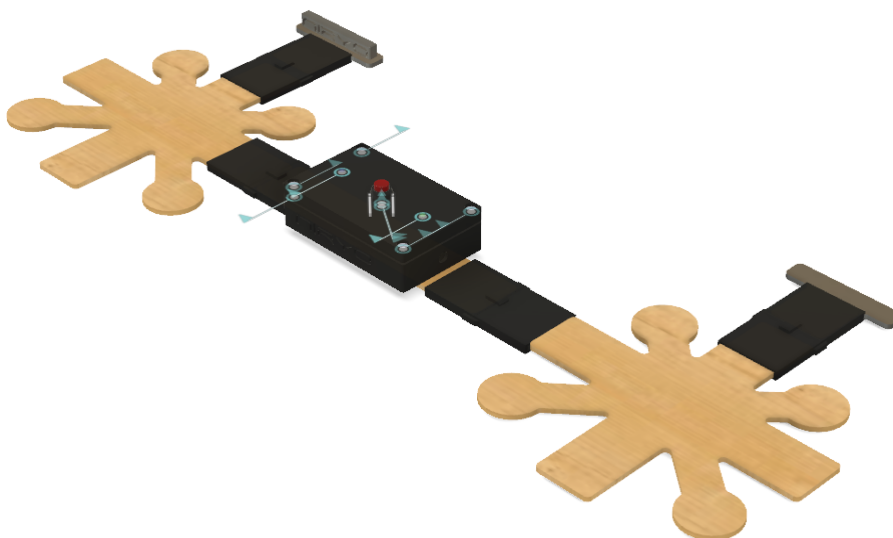


figure 9: flipping assembly

dimensions: 812.004x250x12 mm

Robots

The robots need to be set on their stand, the back part (the one with connectors) facing you.

Be sure to bolt the robots pads with the hand bolts so that the robots are securely fastened to their stand.

Wiring

To wire the demonstrator you can follow the scheme below:

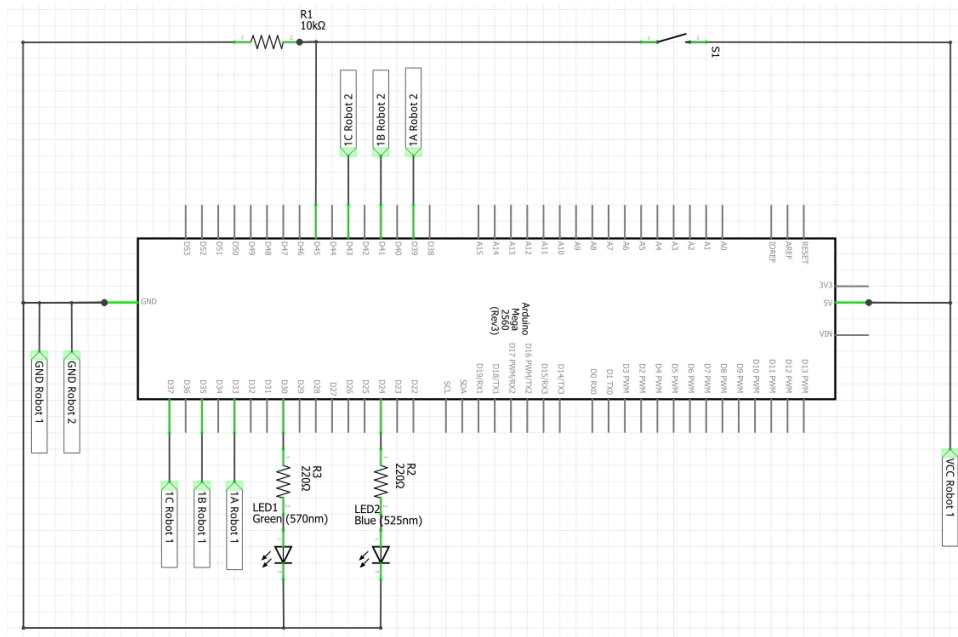
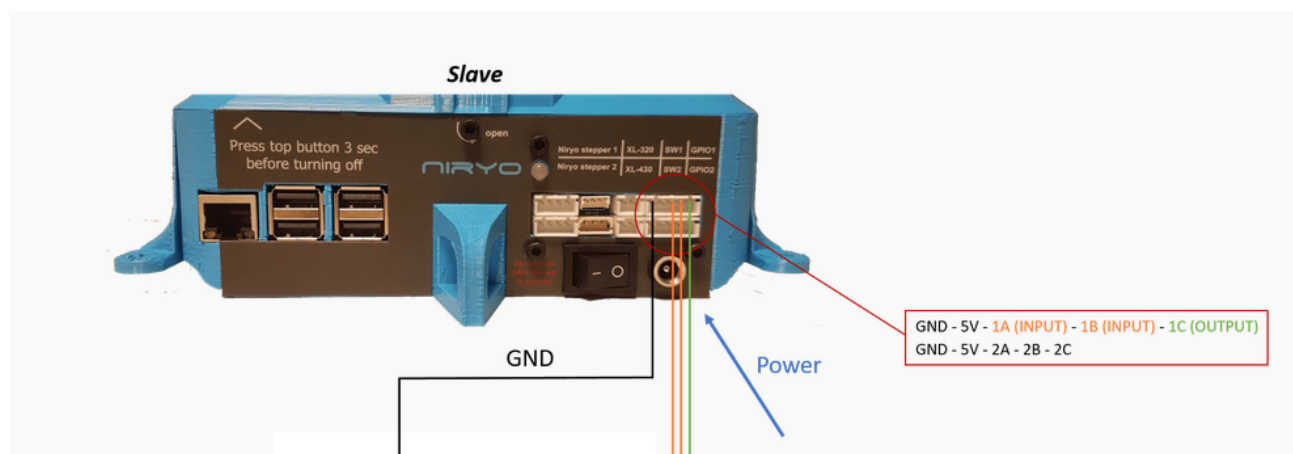


figure 10: electrical scheme of the demonstrator

Then connect the wire to the robots, to do so look at the labels above.



Then, put the Arduino board in the control box, put the leds in the little holes, and the push button in the big one.

Take the jumpers that need to be connected to the robots out of the control box by the holes on the right and left sides, and connect them to the robots like above.