

How to set-up the APC robot

1. Build the structure

In order to build the Centro E.Piaggio's APC structure it is necessary to retrieve these components

- 3 qbMove Maker pro
- 1 Small SoftHand
- 1 PrimeSense camera
- 1 Piston
- 3 qbmove Maker Pro boards with custom firmware to move the linear axes
- 3 Maxon DCX 22 Motors
- The necessary to build a cartesian frame robot that covers an area of 1.780m X 1.000m

2. Basic setup

Once the structure is built the basic procedure to start using the robot is the following;

- Flash the firmware on the qbMove Maker Pro boards used for moving the linear axes;
- Calibrate the linear axes according to their length and the motor associated to them. The linear axis guide must be measured (in millimeters) and the encoder ticks of the motors of a complete excursion of the axis must be associated to the axis length. In this way a proportional constant which converts the encoder ticks to a movement of the axis in millimeters can be calculated;
- Set the correct IDs on the boards. The first one, relative to Z axis (vertical movement, parallel to the shelf) has ID equal to 1. The second one, relative to X axis (horizontal movement, parallel to the shelf) has ID equal to 2. The other IDs are sequential to the first ones, the last one is the one relative to the SoftHand which has ID equal to 7;
- Set the distance offsets of the structure from the shelf. The distance offsets are measured from the lower left edge of the shelf to the hand center;
- Connect and install the camera to the right position with the right angle. The angle is the same of when the camera was collecting images for the database of the object to grasp. The angle is measured through the use of gyroscopes and accelerometers;
- Power the structure with 24V DC;