OpenGrip

Assembly Instructions

1.0 Main Heat Sets

1.1 Stick adhesive silicone to jaw, and trim excess with razor blade

1.2 Install 5 M2 short heat sets into jaw rail section, repeat for both jaws

1.3 Install 6 M2 short/long heat sets into the main body

1.4 Install 2 M2 short heat sets into the ends of the jaw, repeat for both jaws

I use a pointed tip soldering iron at 230C, I normally spin them as I insert them and use tweezers to hold them down while they cool

1.1

1.2

1.3

1.4

2.0 Mount Rails & Jaws

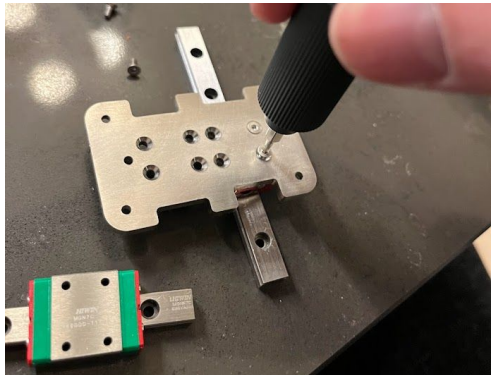
2.1 Install 8 M2 x 5mm flat head screws into both carriages, I use a pair of calipers the keep the rails parallel while tightening

2.2 Install 10 M2 <10mm socket head screws into the heatsets in the jaws

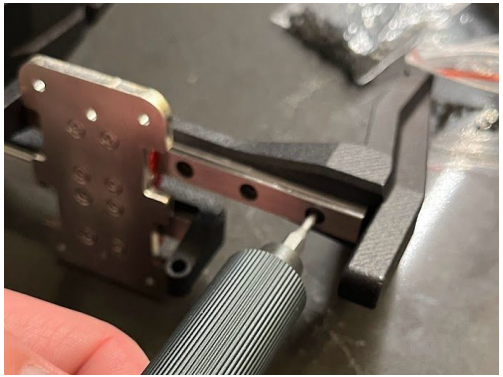
2.3 Press CF Idlers into the constant force springs, then screw the constant force spring though the mounting hole into the gripper jaw, on the side shown, using an M2 5mm flat head screw

2.4 Stretch constant force spring to line up with hole in carriage mounting plate, push M2 20mm flat head screw through plate, then through CF Idler & CF Idler Cap as shown

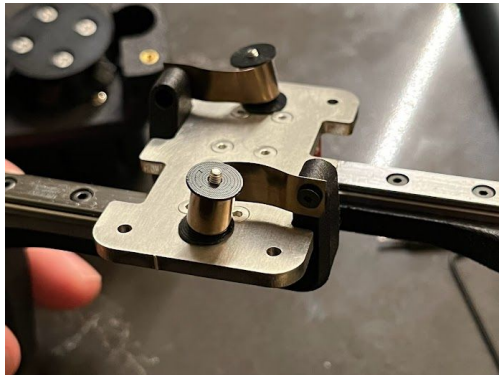
2.1



2.2



2.3 & 2.4



3.0 Install Dynamixel & Pulley

3.1 Install a M2 short heat set into the drive pulley

3.2 Remove 4 front screws on Dynamixel, install plastic spacers

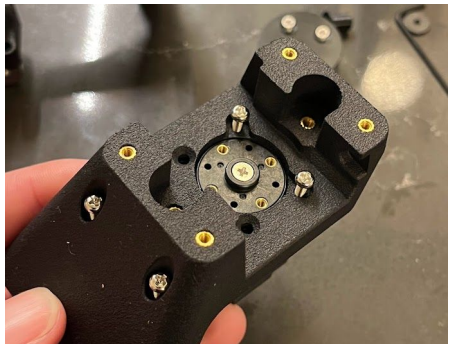
3.3 Slide Dynamixel into main structure and install 4 M2 screws from the Dynamixel kit

3.4 Set Dynamixel angle to 0deg, install pulley with 4x M2 14mm flat head screws such that the slot in it is at the angle shown with the blue line

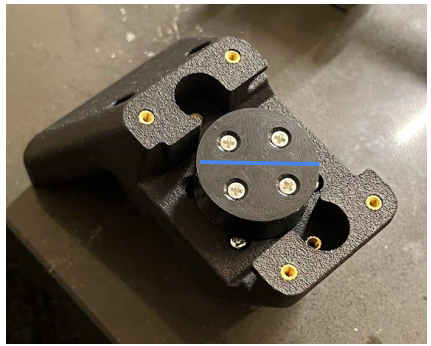
3.1

3.2

3.3



3.4



4.0 Assemble Jaws to Main Structure

4.1 Align jaw assembly to main structure, screw the M2 20mm screws holding the constant force springs into the gripper structure - this takes some wiggling since the springs are forcing the screw sideways

4.2 Install 4 M2 <10mm flat heads in the corner of the carriage mounting plate

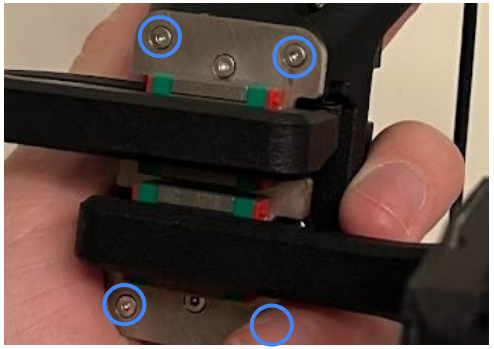
4.3 Thread flat belt through jaw, drive pulley, then other jaw

4.4 Install M2 12mm screw into drive pulley to lock flat belt in place

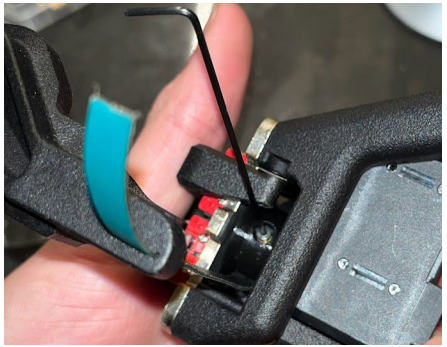
4.5 Install M2 <10mm screw into both jaws in location shown to lock flat belt, then trim the additional length

4.1

4.2



4.3 & 4.4



4.5

5.0 Camera (Optional)

5.1 Disassemble webcam mounting features, leaving main plastic hinge piece. Cut it with a hacksaw (I used a sacrificial print to find where to cut it)

5.2 Install 2 M2 heat set inserts into the webcam clamp

5.3 Slot webcam into rectangular hole into gripper structure

5.4 Install two M2 cap screws through gripper structure into webcam clamp

5.1

5.2

5.3 & 5.4

Complete!

Your final assembly should look like the photos below, and as the Dynamixel rotates towards 360deg the jaws will close.

Some final notes:

- Present Load value in the control table can be used to find the force
- Make the rotation direction such that the belt is parallel to the rail! If the belt is angled, it can twist the jaws and the rotation to translation conversion won't be linear
- To mount to the gripper, add features to the CAD or screw directly into the Dynamixel

If you have any questions, check the CAD or feel free to reach out to me at chaight@uwaterloo.ca