

Lesson 4 Deviation Adjustment

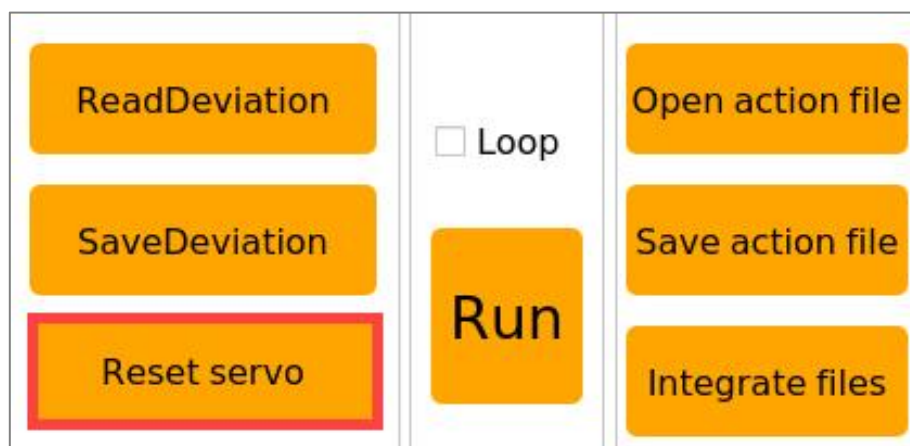
If the deviation of the servo main shaft is caused by the fall of the robot arm during assembly, or the replacement servo, and other operations, the generated deviation must be adjusted. Deviation is divided into two cases: small deviation and large deviation. Depending on the situation, the debugging method is also different.

1. Preparation

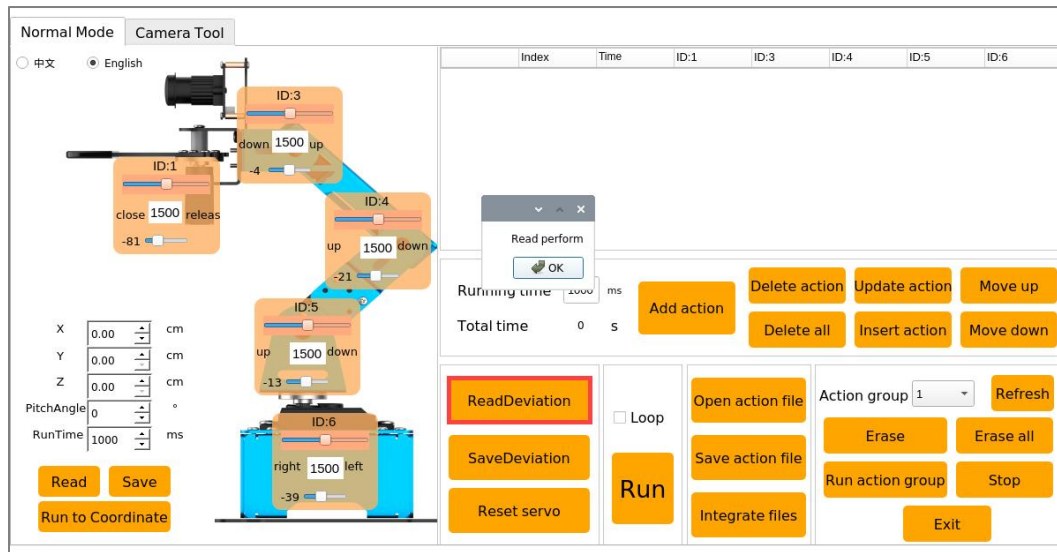
- 1) Turn on ArmPi mini according to the tutorial in “4. Quick User Experience/ Lesson 1 First Start ArmPi mini”.
- 2) Connect the robot via VNC remote tool according to “4. Quick User Experience/ Lesson 2 Set Development Environment”.

2. Deviation Judgment

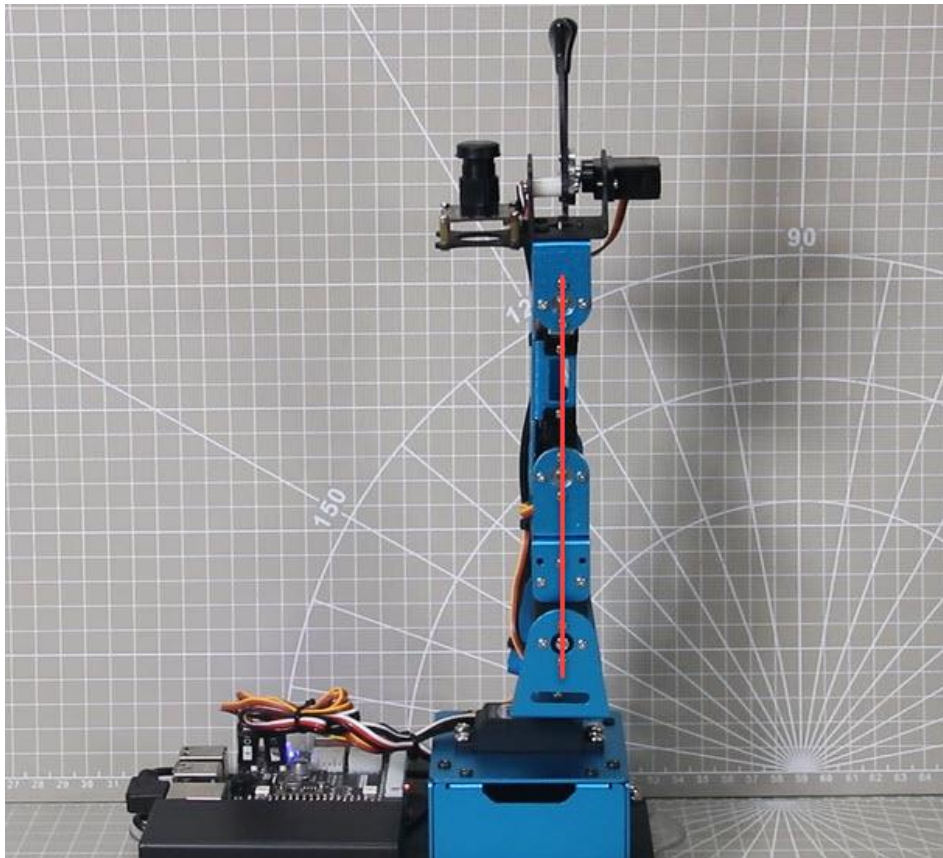
- 3) After connecting ArmPi mini, open PC software.
- 4) Then click “Reset servo” in the software interface, and then the robot arm will stand up straight.



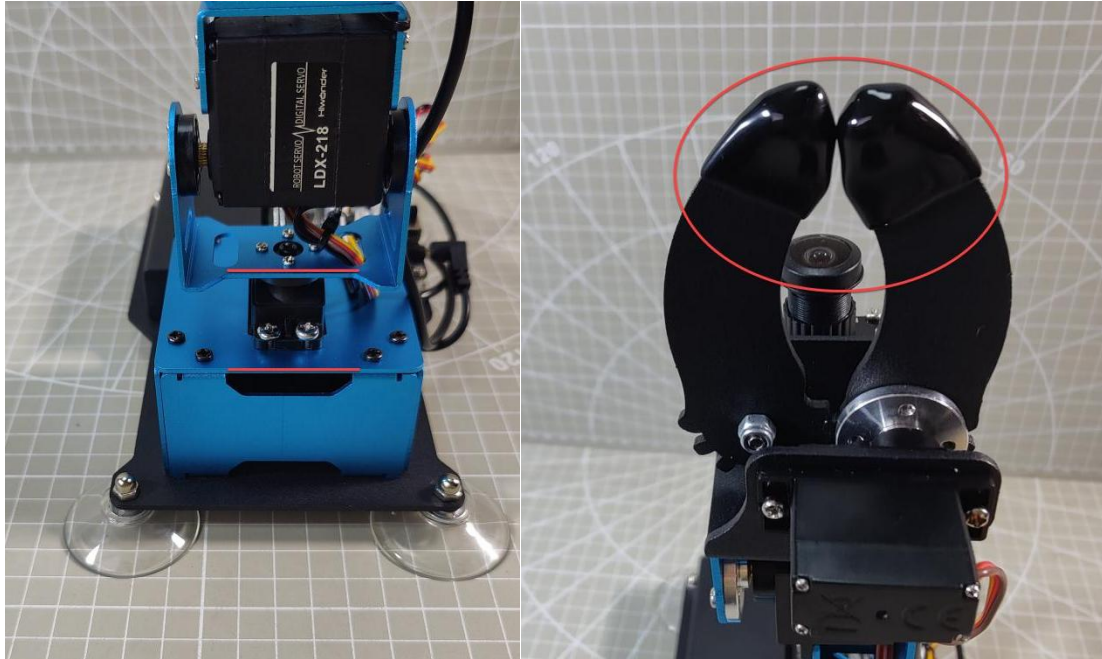
5) Then click “Read deviation” to synchronize the deviation to the left servo control area.



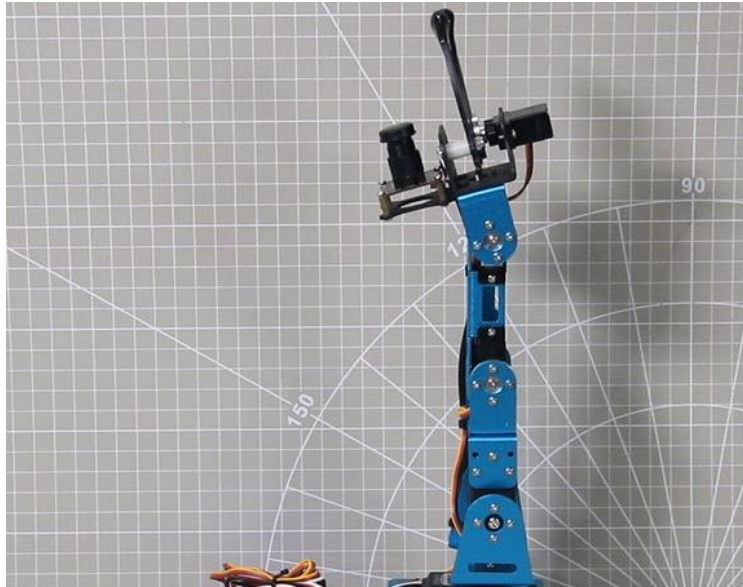
6) After resetting robotic arm, the main shaft screws of servo ID3-ID5 are in a straight line (it is named as “centerline” in the following steps), as the figure shown below:



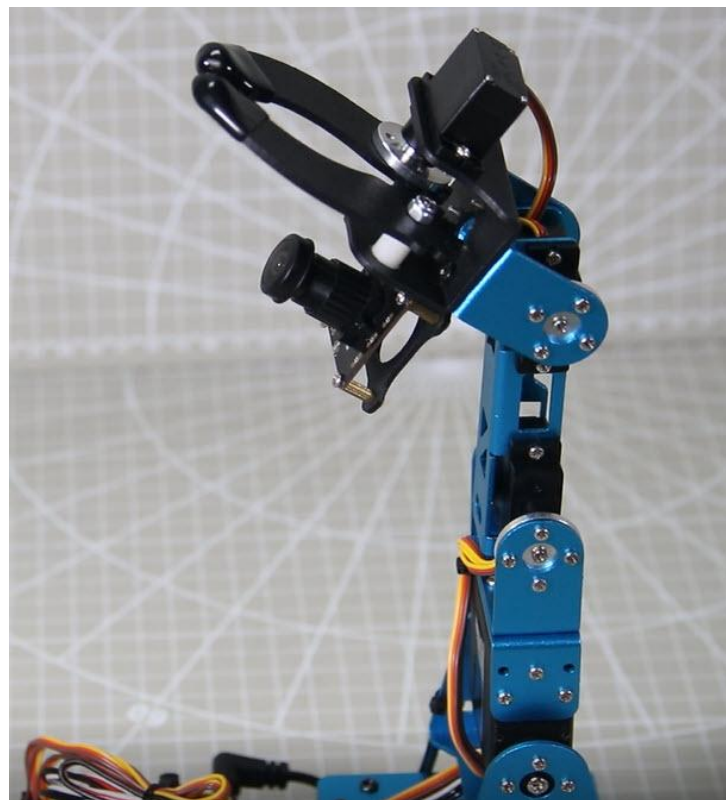
7) The the groove line of the U shape bracket of ID6 servo are parallel with the edge of the upper cover of the base, as the left figure shown below, and the gripper is closed, as the right figure show below. Under this situation, the robotic arm is ready to use, you can skip this lesson.



8) If the angle between centerline and servo is less than 13 degrees, it is classified as small deviation and can be adjusted by PC software. You can follow the operation instruction in “3. Small Deviation Adjustment” to adjust the small deviation. Here i will take ID3 servo as example, as the figure shown below.

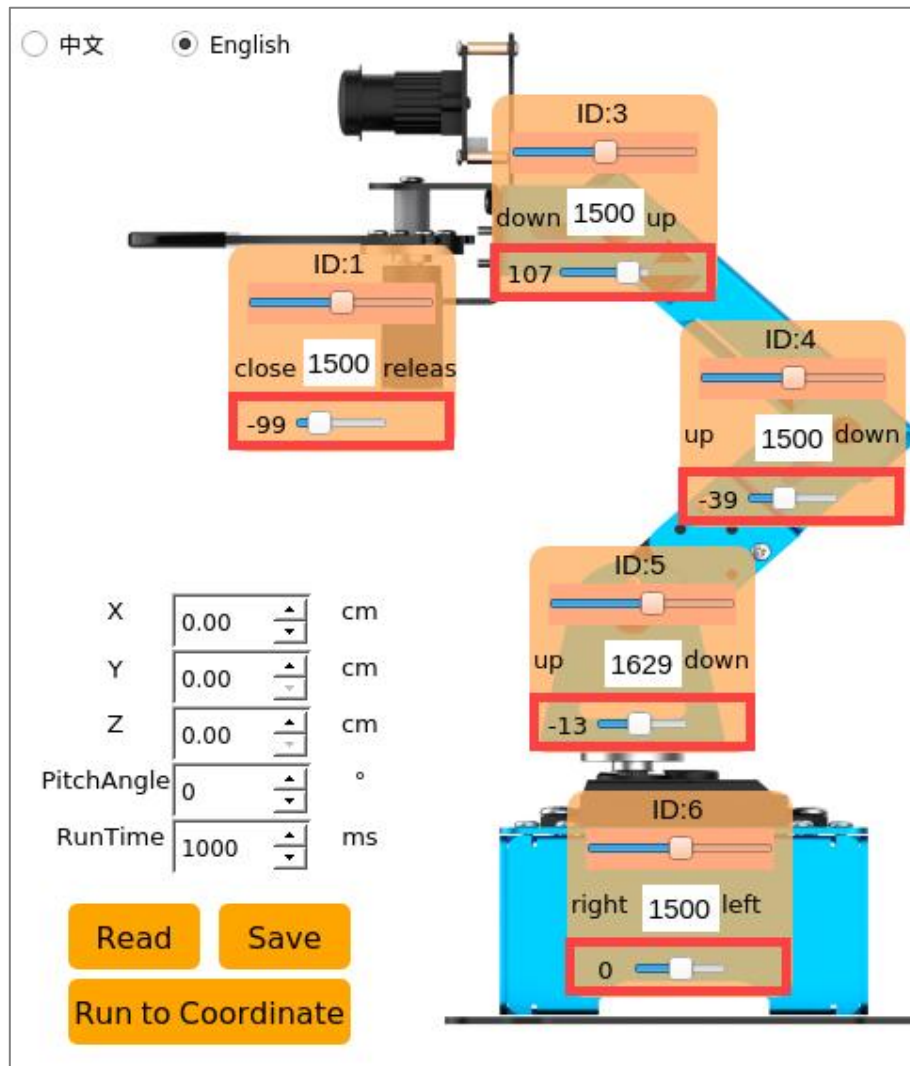


9) If the angle between centerline and servo is larger than 13 degree, it is classified as large deviation and can not be adjusted by PC software which the extreme adjustment value is between -150 and +150. Under this situation, you can follow the operation instruction in “4. Large Deviation Adjustment” to adjust large deviation.

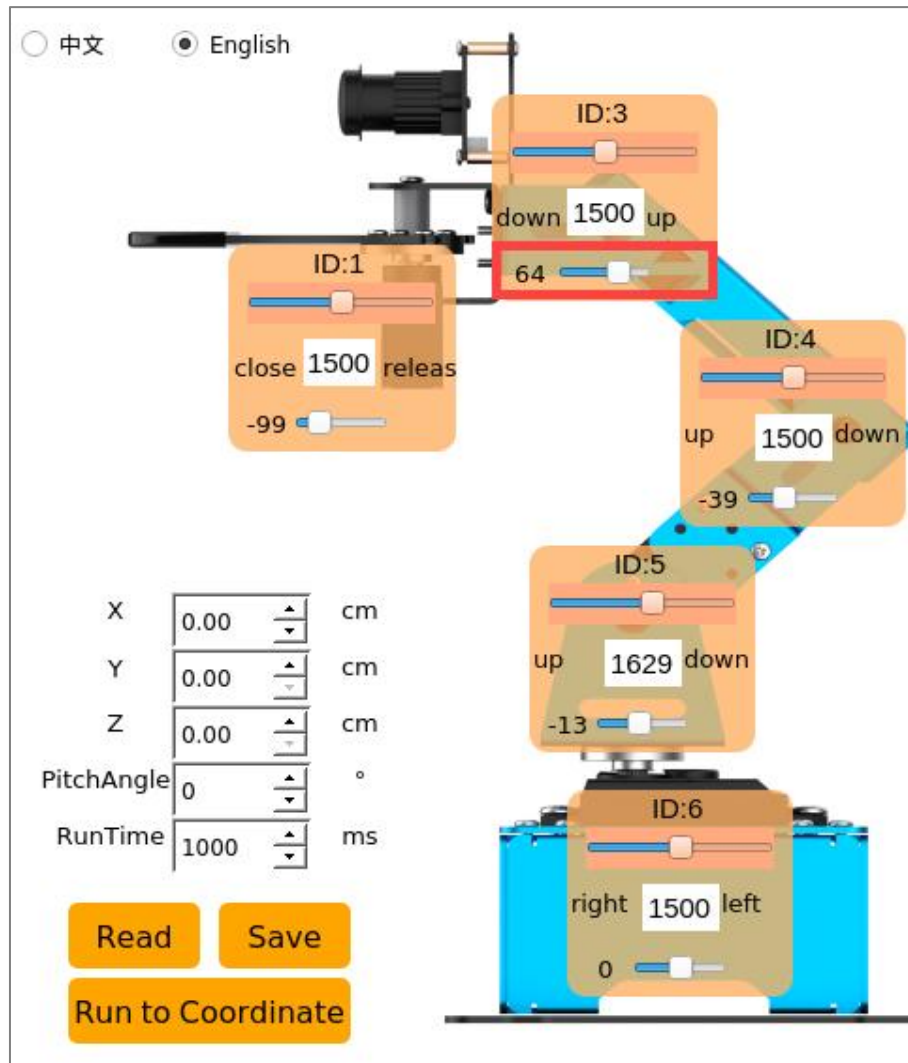


3. Small Deviation Adjustment

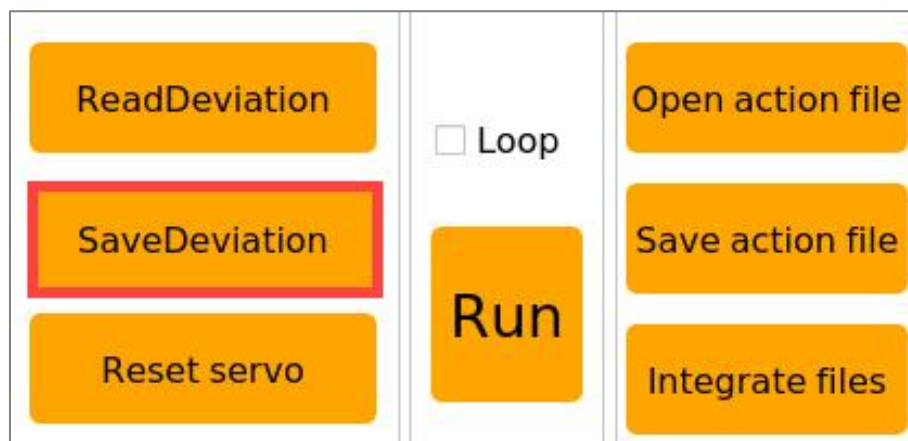
1) Small deviation can be adjusted by dragging the deviation adjustment slider of PC software. (Note: the short slider bar below is for adjusting deviation)



2) Drag the slider of ID3 servo to make robot arm stretch straight. (the values in following figure is just for reference, you need to adjust your own robot according to the actual situation.)



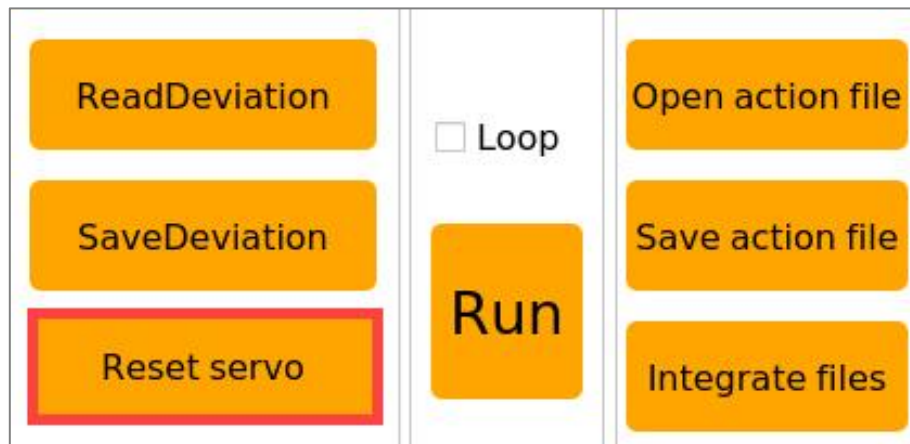
3) The click “Save deviation” to save the deviation value into the robot arm.



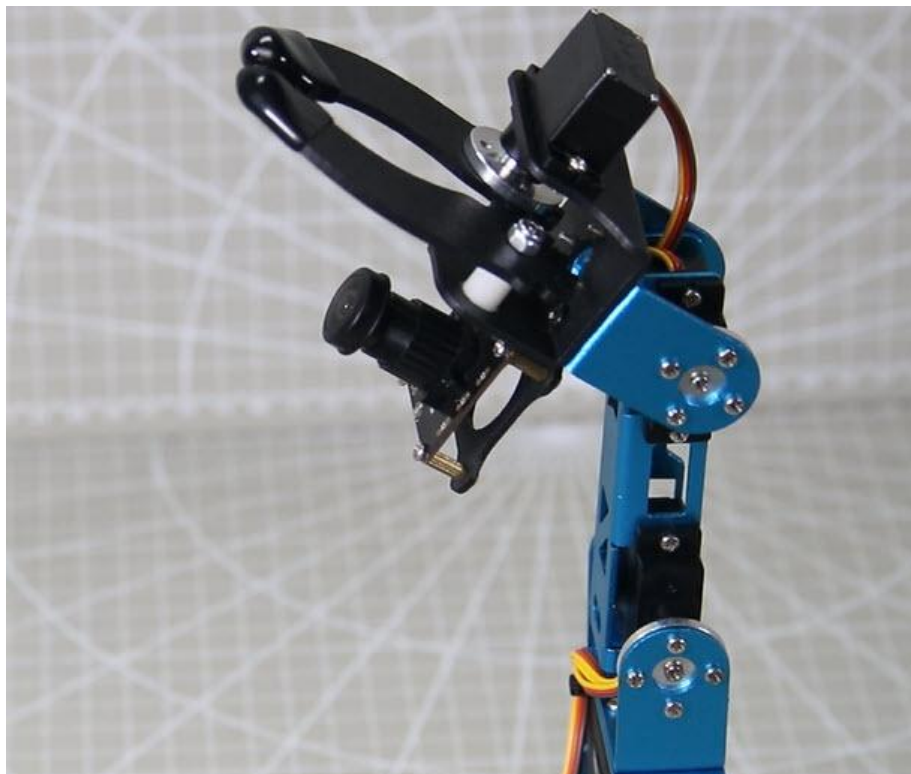
4. Large Deviation Adjustment

When adjusting the large deviation, U shape bracket must be removed from servo and reset the servo to initial position. Then repeat the operation steps of small deviation adjustment. Again.

- 1) Click “Reset servo” in PC software to make robot arm stretch straight.

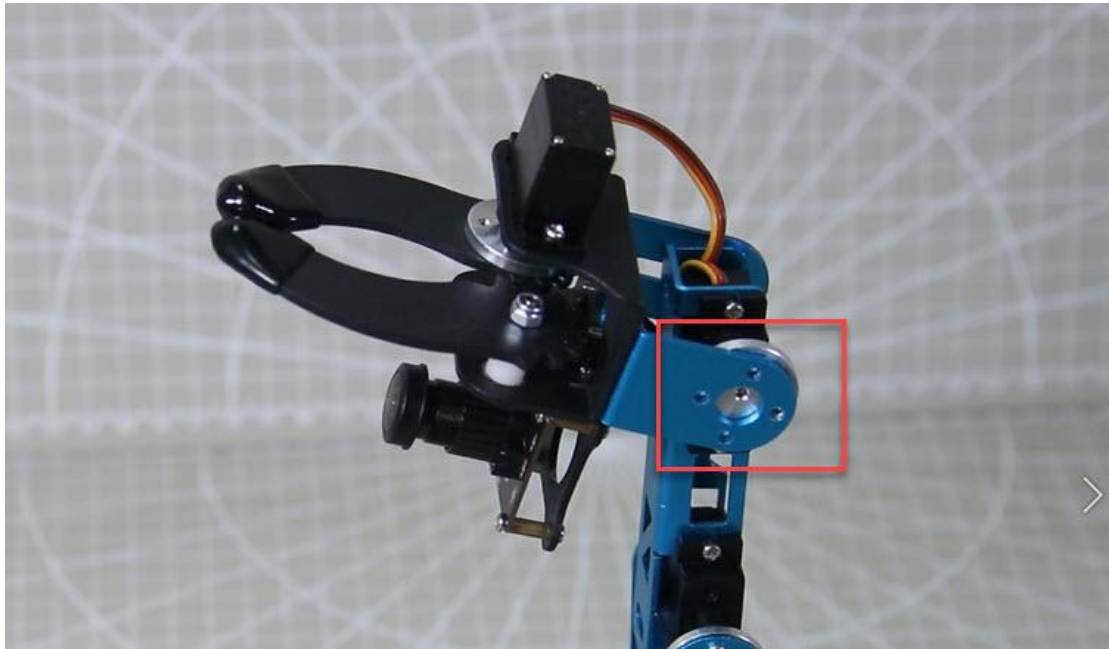


- 2) At this time, you can find ID3 servo with obvious deviation and the deviation angle is larger than 13 degrees.

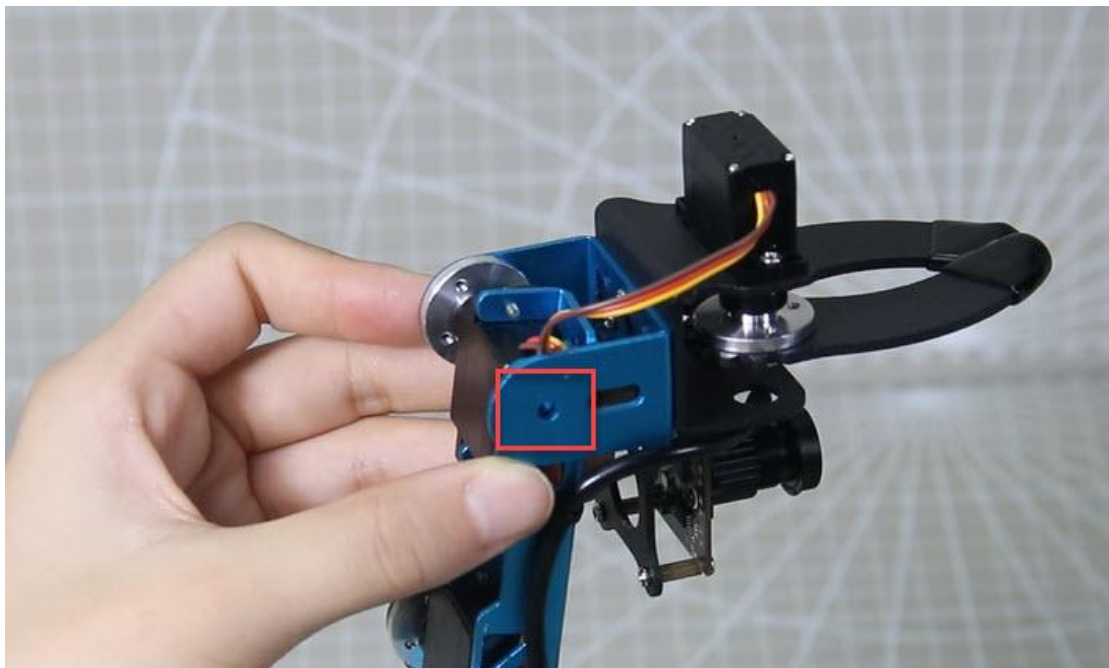


Unplug the robot arm. (Servo will be removed in the following steps, so do not operate when power is supplied.)

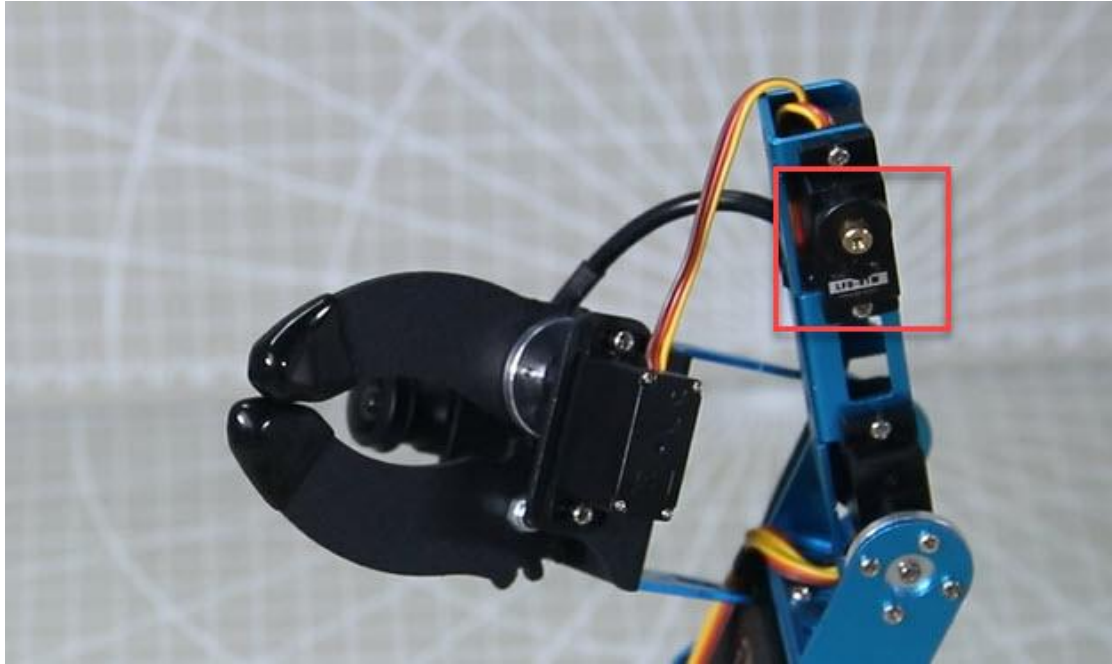
3) Unscrew the main servo horn of ID3 servo.



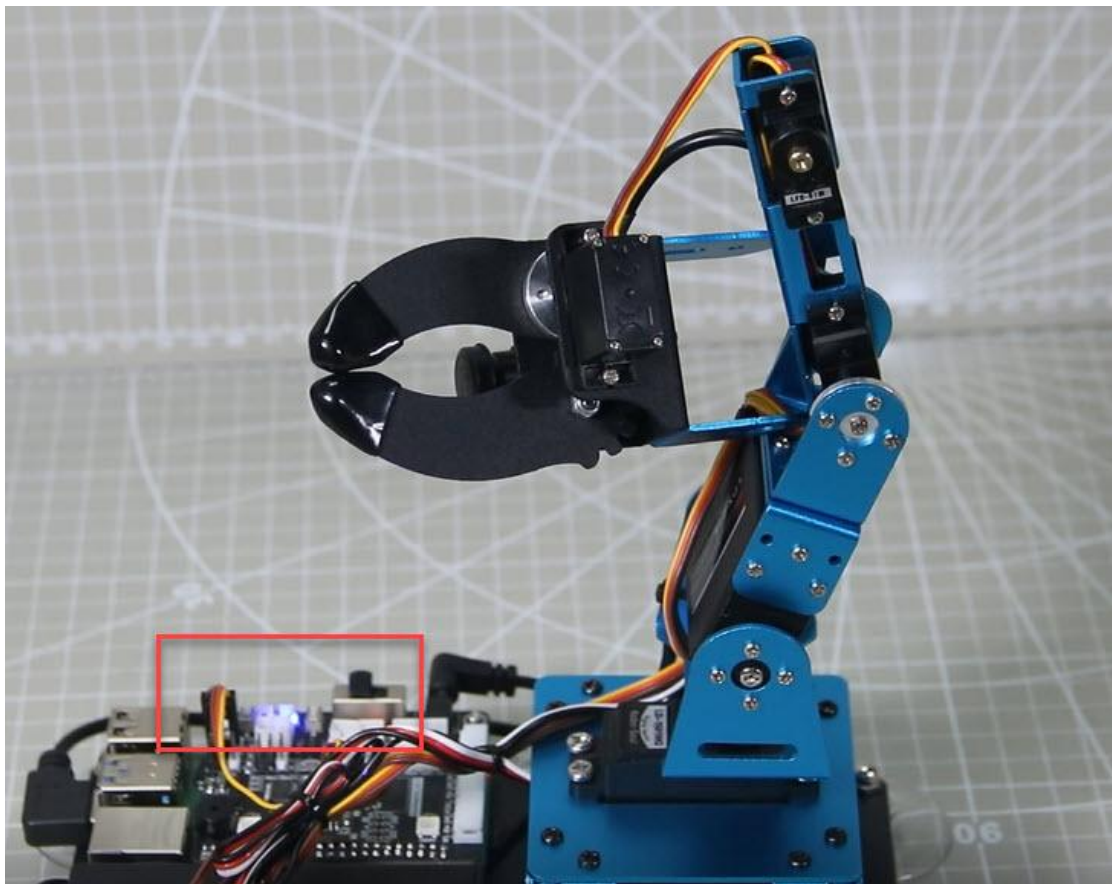
4) Next, remove the rivet holding U shape bracket.



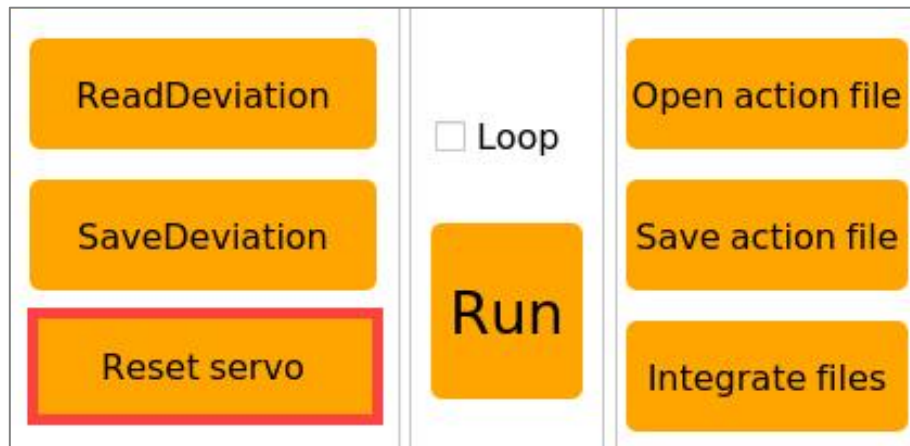
5) Then pull out the main shaft from the metal servo horn.



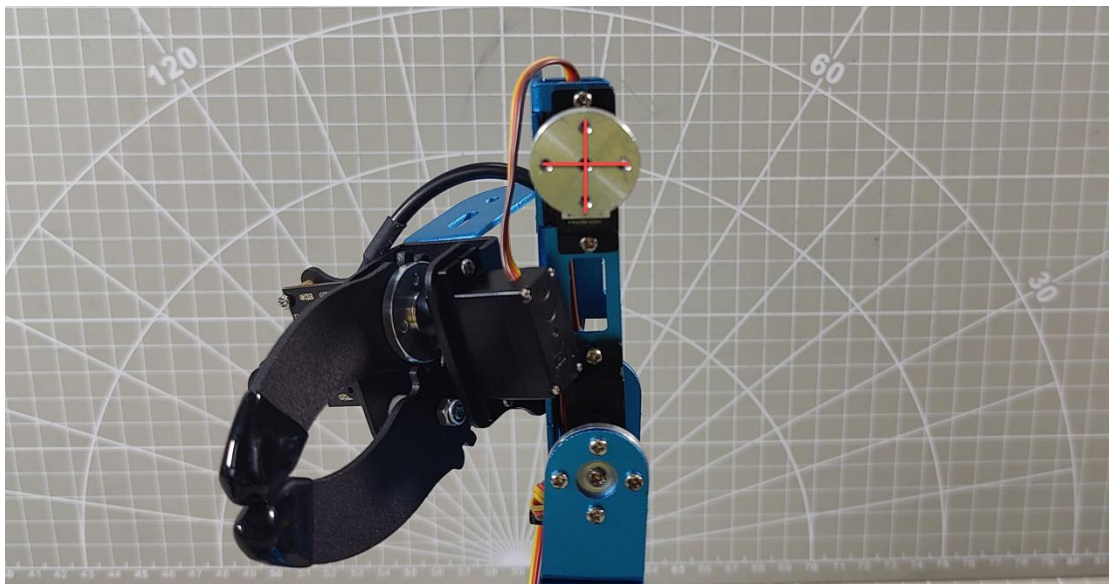
6) In addition to ID3 servo, remove all the servo cables from Raspberry Pi expansion board (Do not skip this step), and then turn on Raspberry Pi.



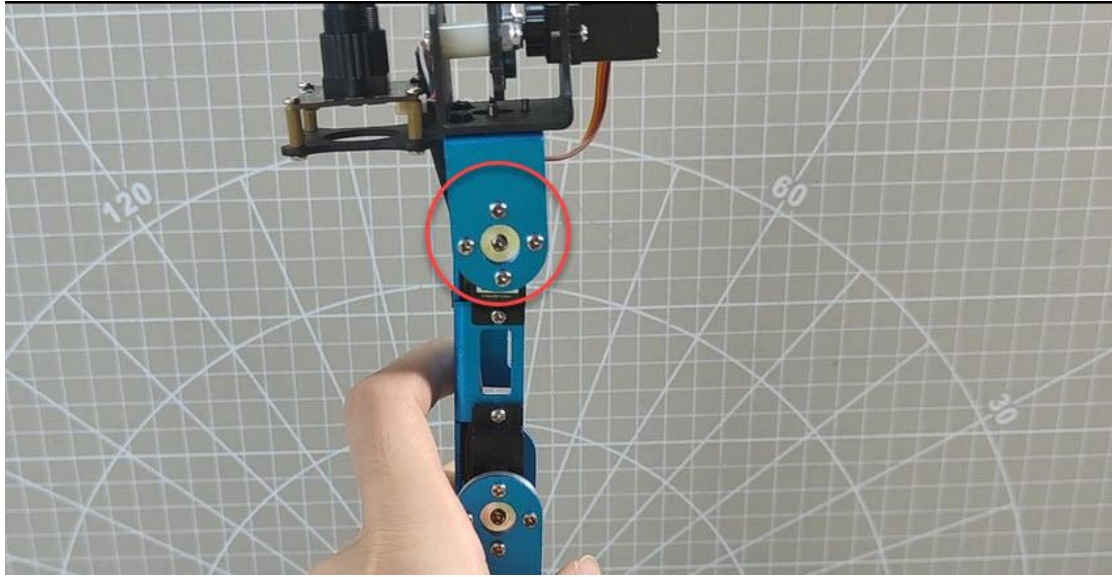
7) After turning on robot arm, connect it via VNC and open PC software. Then click “Reset servo”. At this time, servo ID3 has been reset to initial position.



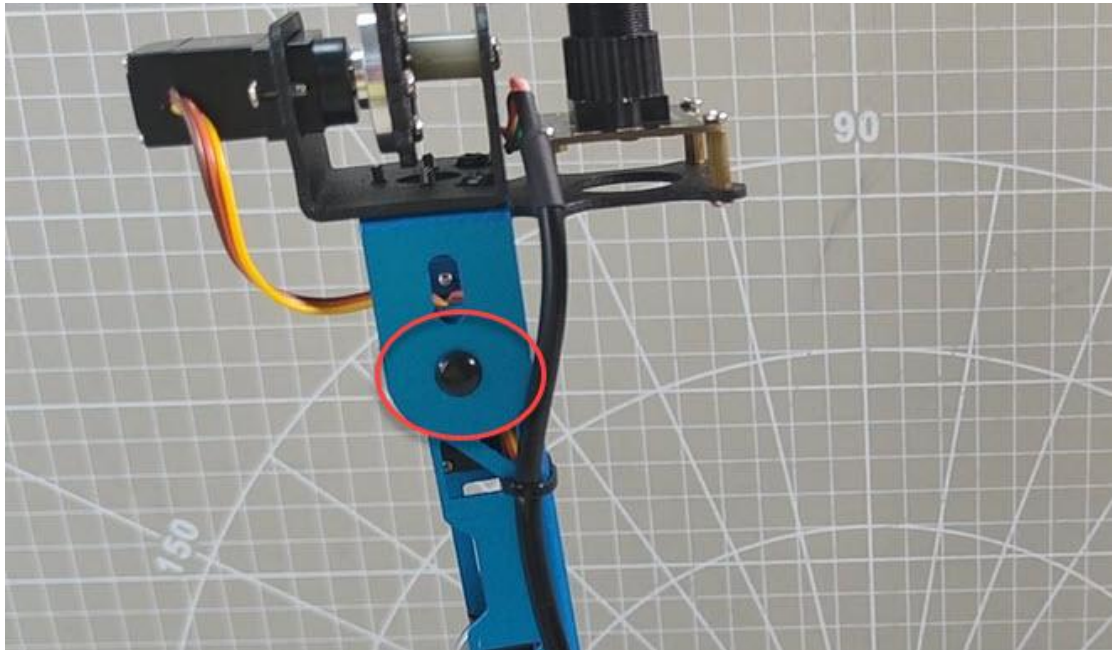
8) Turn off robot arm. Then assemble the servo horn back to servo in cross shape. (Note: the servo has been at initial position, do not forcefully rotate the main servo. If the servo horn is not assembled in cross shape, you need to repeat the operations steps 6-8 to adjust deviation again.)



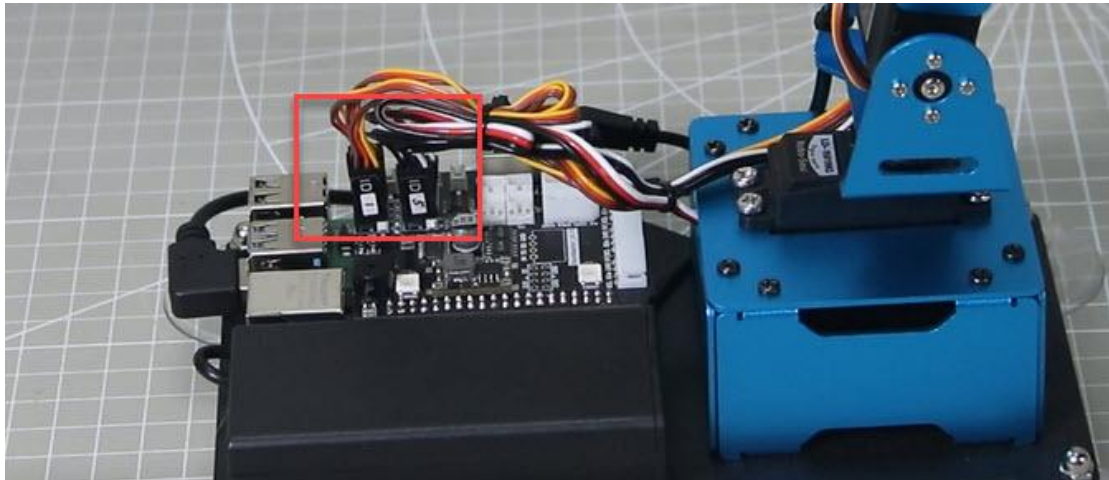
9) Then fix the metal servo horn with screws.



10) Assemble the rivet to the side of bracket.



11) Connect the servo cables back to the Raspberry Pi expansion board. (Note: the servo ID tag corresponds to the interface number of expansion board. The yellow cable should be connected to “S” signal terminal, red cable to “+”, brown cable to “-”, white cable to “S”, red cable to “+”, black cable to “-”. Do not wrongly connect the cables, otherwise the servo will be burned out.)



12) Then, repeat the operation steps of “3. Small Deviation Adjustment” to adjust the small deviation.