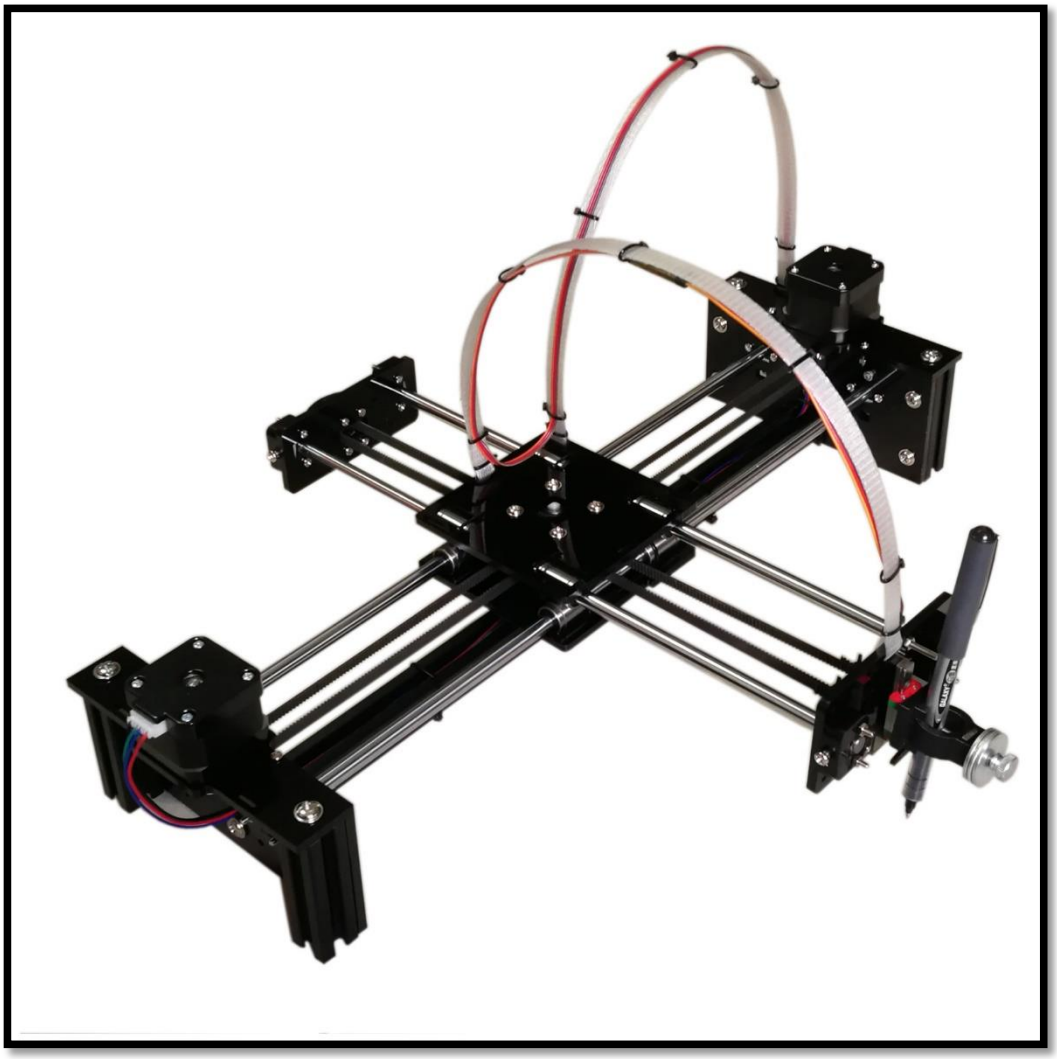
AX4 Pen Plotter Suite Assembly Course



Before assembly, please count the number of parts and components, and do not tighten the screws too tightly during assembly, because they need to be corrected at any time. The screws on the acrylic plate should not be too tight to prevent the plate from breaking.

Part detail information

(1) Machine frame

2 PCS 8mm polished rods 450mm, 2 PCS 8mm polished rods 360mm
1 PCS 421mm and 4PCS 68mm European standard aluminum profiles in 2020
8 PCS LM8UU linear bearings
25 PCS Acrylic
10 PCS F624 flange bearings
2 PCS synchronous wheels
Timing belt 1.5m
1 PCS 3D pen holder
25 PCS ties
2 PCS wire fixing straps
1 PCS Linear guide assembly

(2) Electrical control

2 PCS 42 Stepper motor
1 PCS Arduino controller
1 PCS MG90 steering gear
1 PCS power supply
1 PCS USB cable

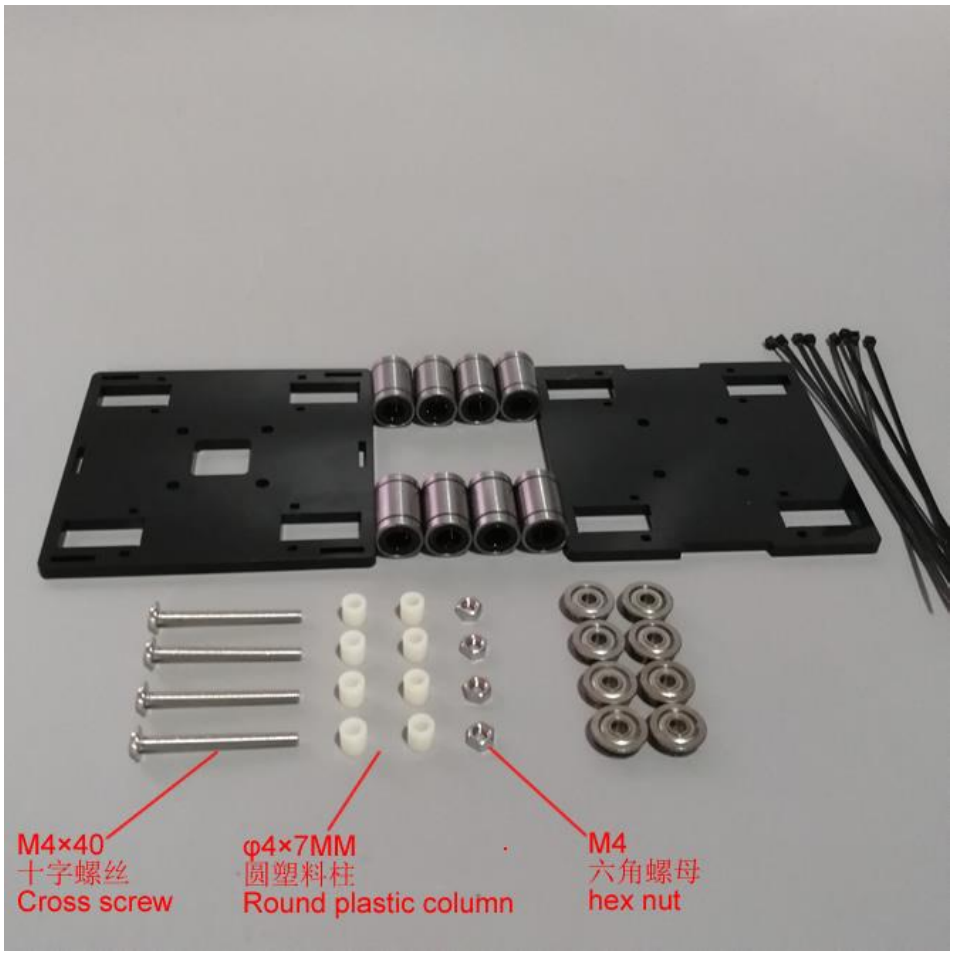
(3) List of screws

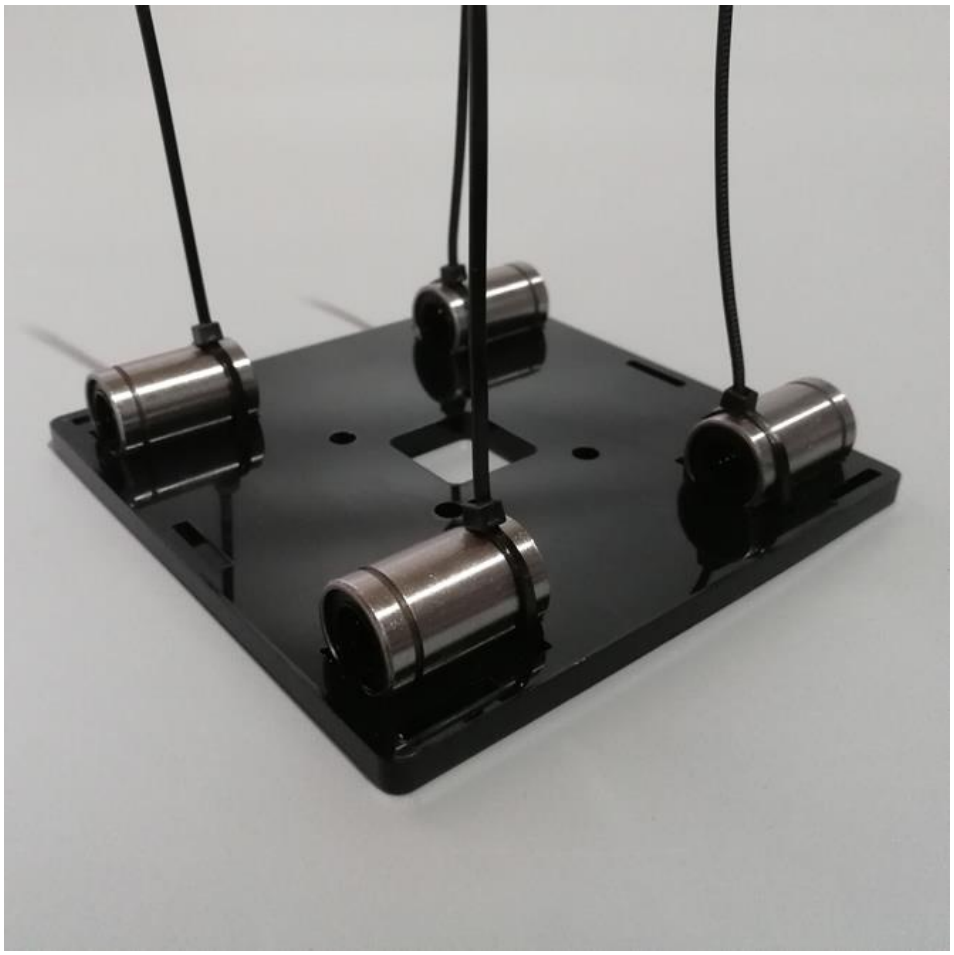
M2 × 6 Phillips screws=4 PCS (sliding table)
M2 × 10 Phillips screws=2 PCS (steering gear)
M2 × 16 Phillips screw=2 PCS (linear guide rail)
M3 × 8 Phillips screws=8 PCS (Stepper motor)
M3 × 12 Phillips screws=8 PCS (Acrylic fixing)
M3 × 20 cross screws=17 PCS (optical shaft fixation+limit)
M3 × 30 Phillips screws=4 PCS (fixed circuit board)
M4 × 12 Phillips screws=8 PCS (optical shaft fastening)
M4 × 30 Phillips screw=1 PCS (rear pulley)
M4 × 25 hand screw=1 PCS (pen holder)
M4 × 40 cross screw=4 PCS (cross pulley)
M5 × 10 Phillips screws=8 PCS (Acrylic and aluminum profiles)
M6 × 12 Phillips screws=6 PCS (aluminum profiles)
M2 hex nut=4 PCS
M3 hex nut=29 PCS
M4 hex nut=5 PCS
M4 square nut=9 PCS
M5 aluminum profile nut=8 PCS
ϕ 4MM × 20 Plastic separation column=4 PCS
ϕ 4MM × 2 Plastic isolation column=2 PCS
ϕ 4MM× 7 Plastic separation column=8 PCS

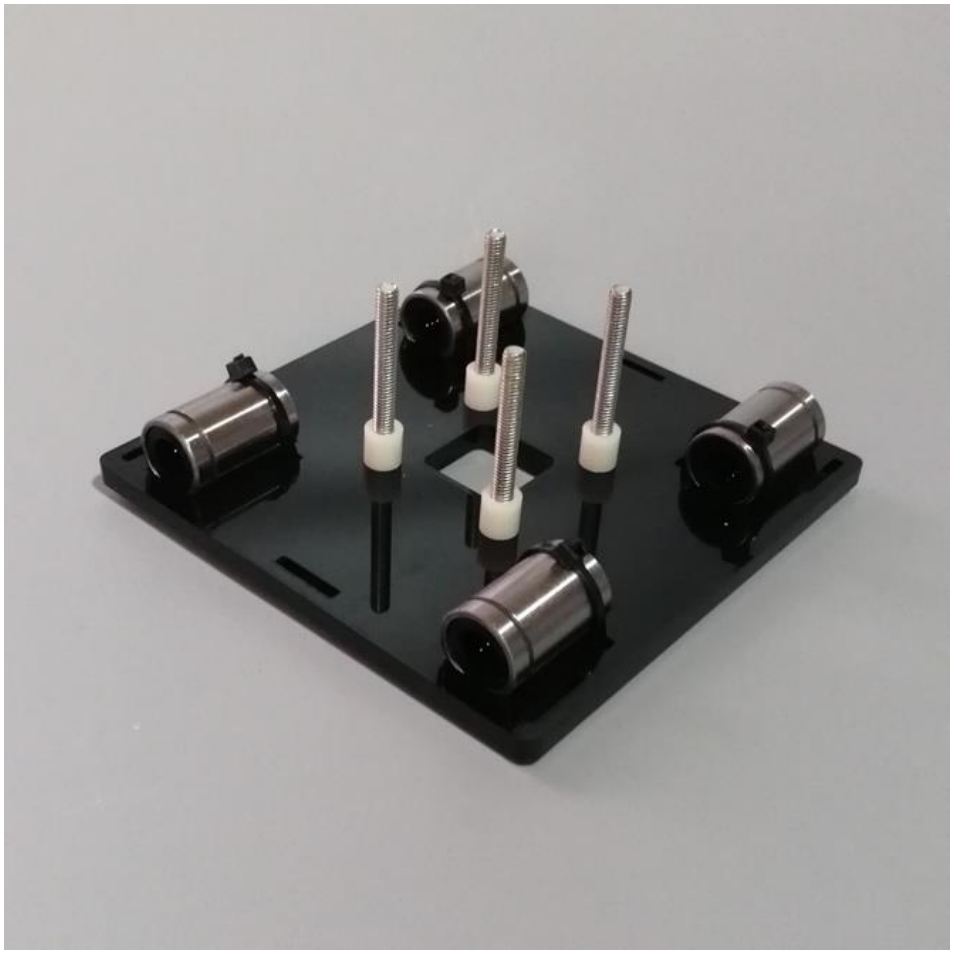
ϕ 3MM × 20 plastic isolation column=4 PCS (matched with laser head)
M3 × 30 Phillips screw=4 PCS (matched with laser head)

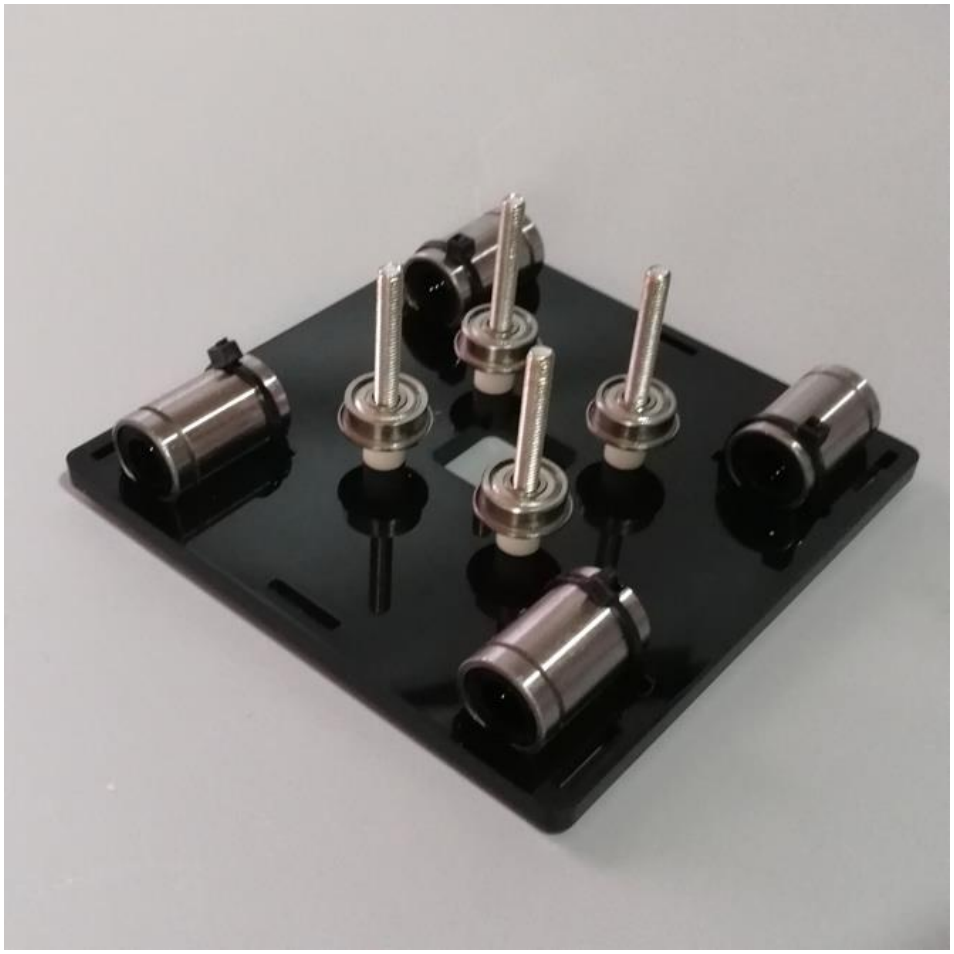
Frame assembly

(1) Assembly of cross slide

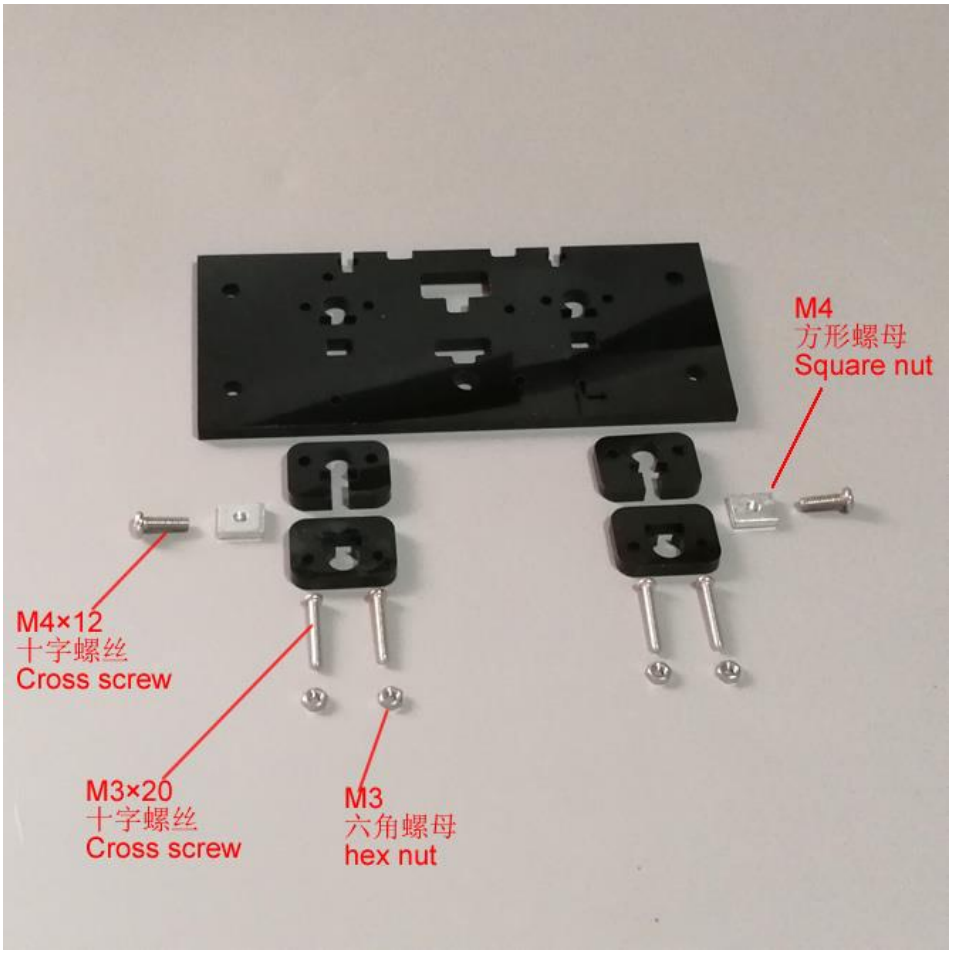


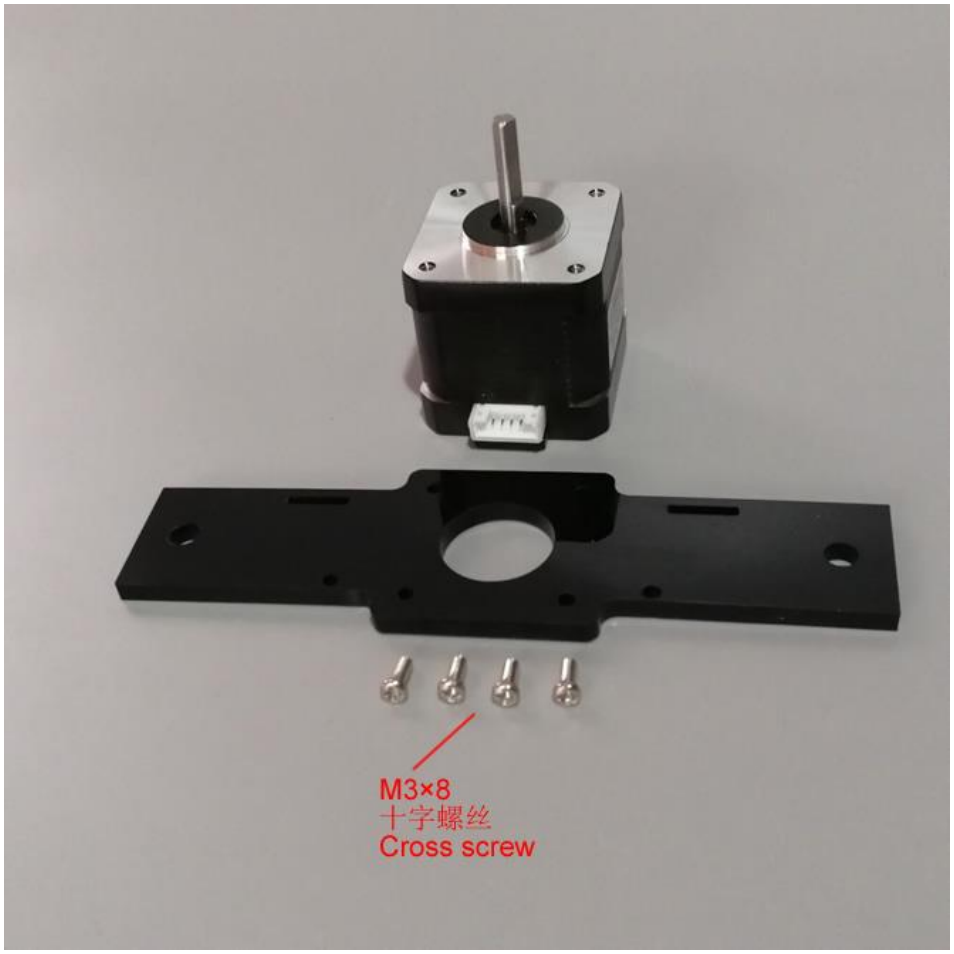


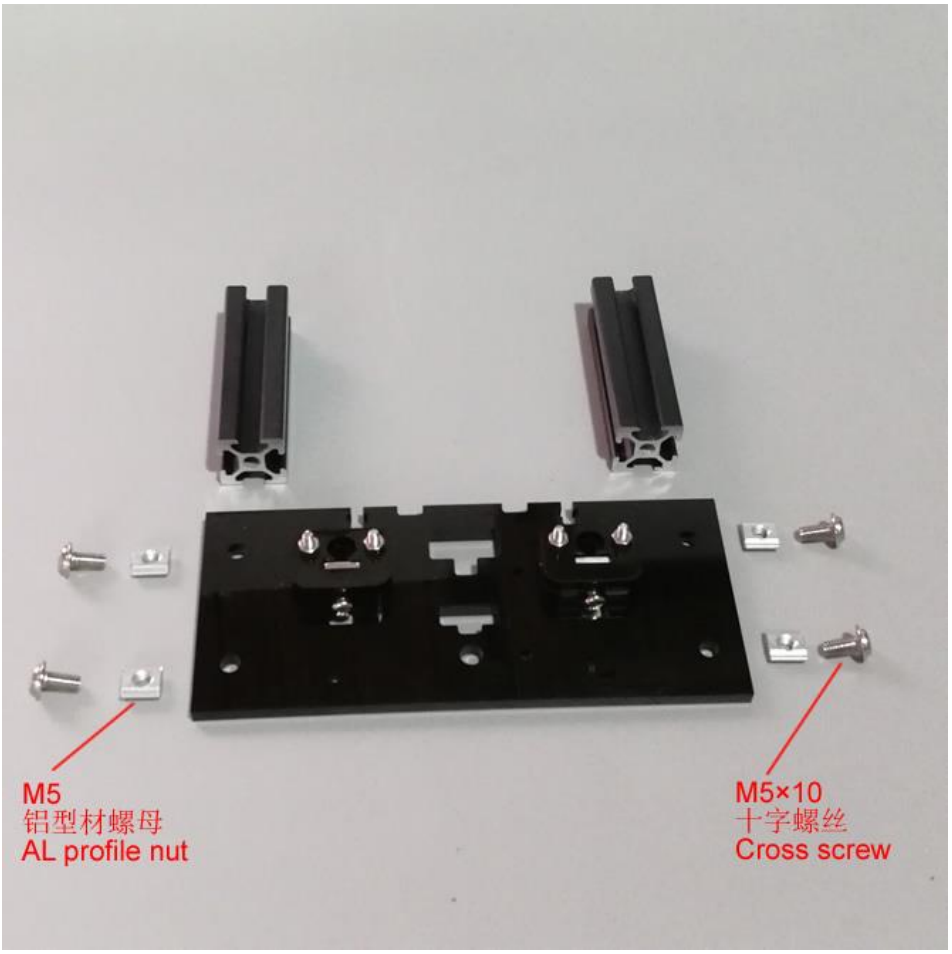


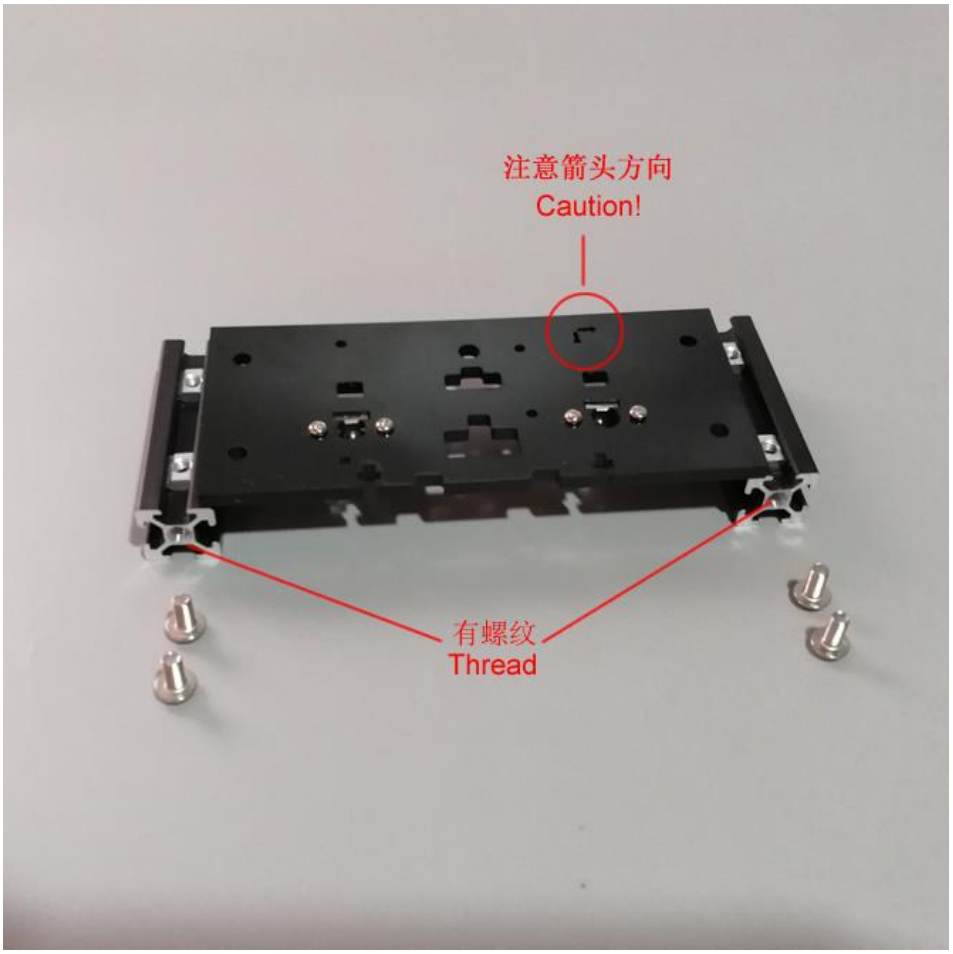


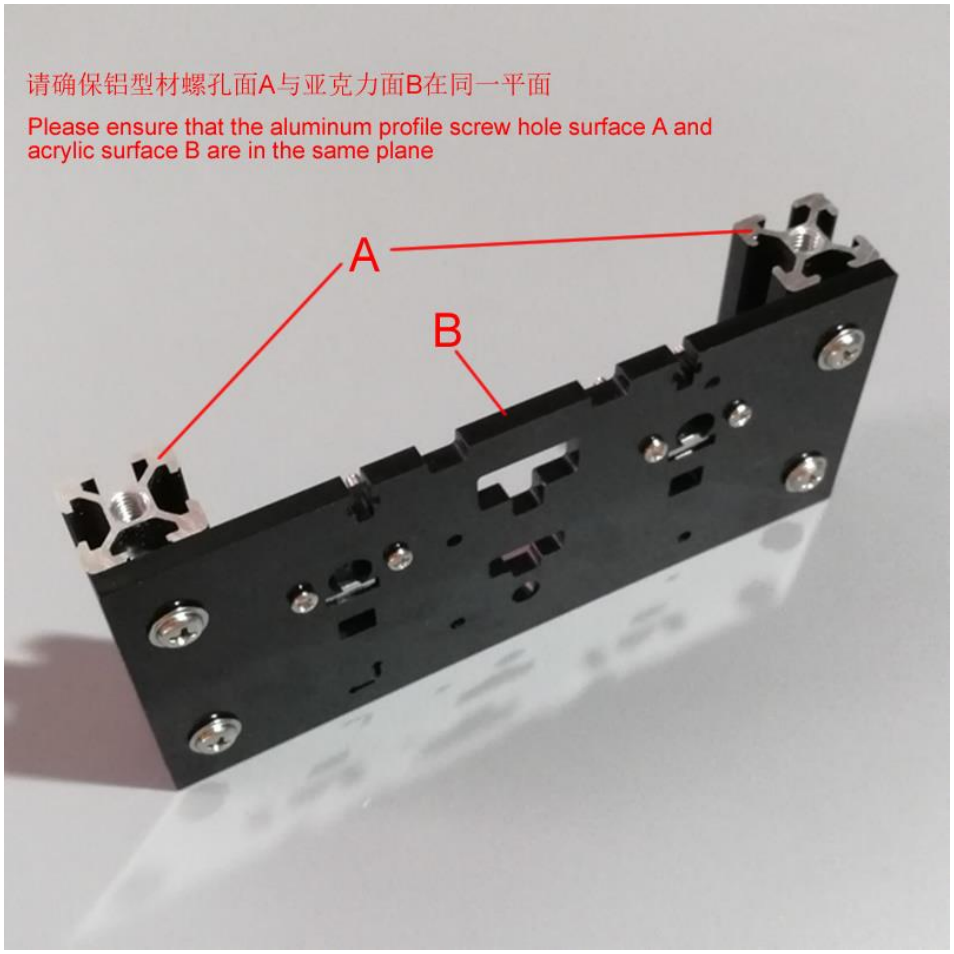
(2) Assembling left and right stepping motor pedestals



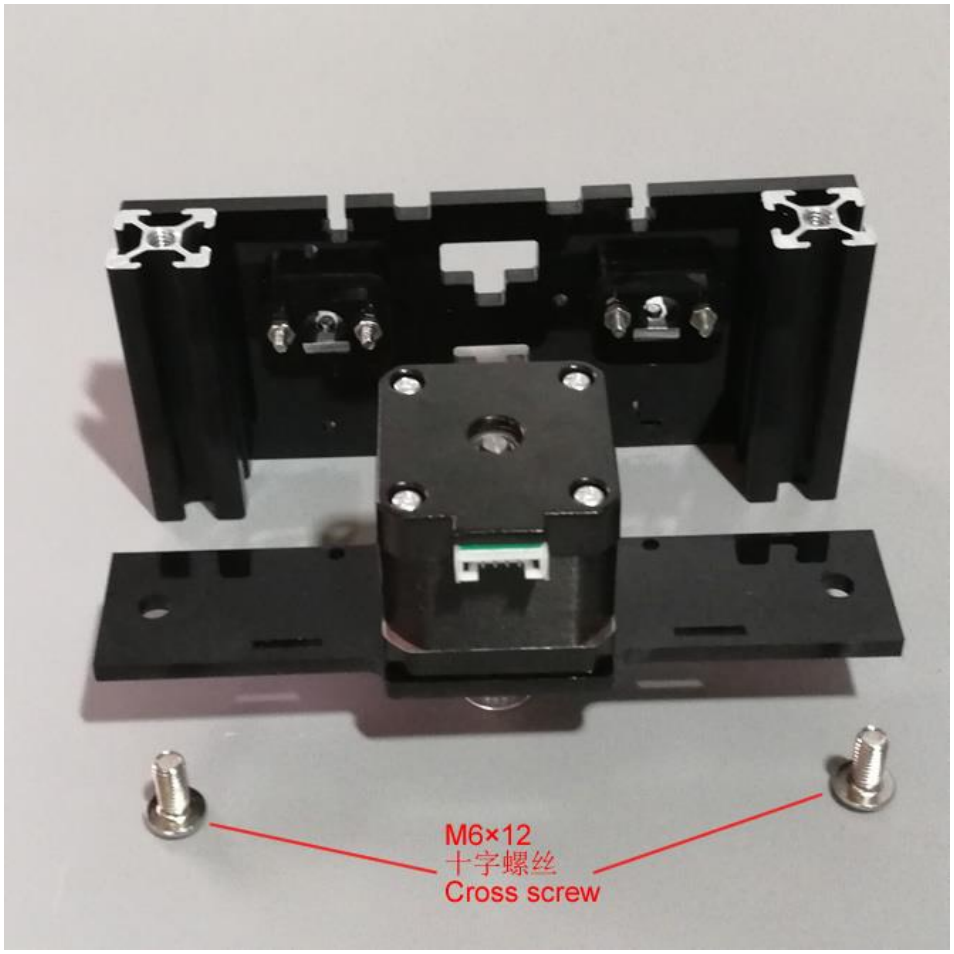

M3×8
十字螺丝
Cross screw

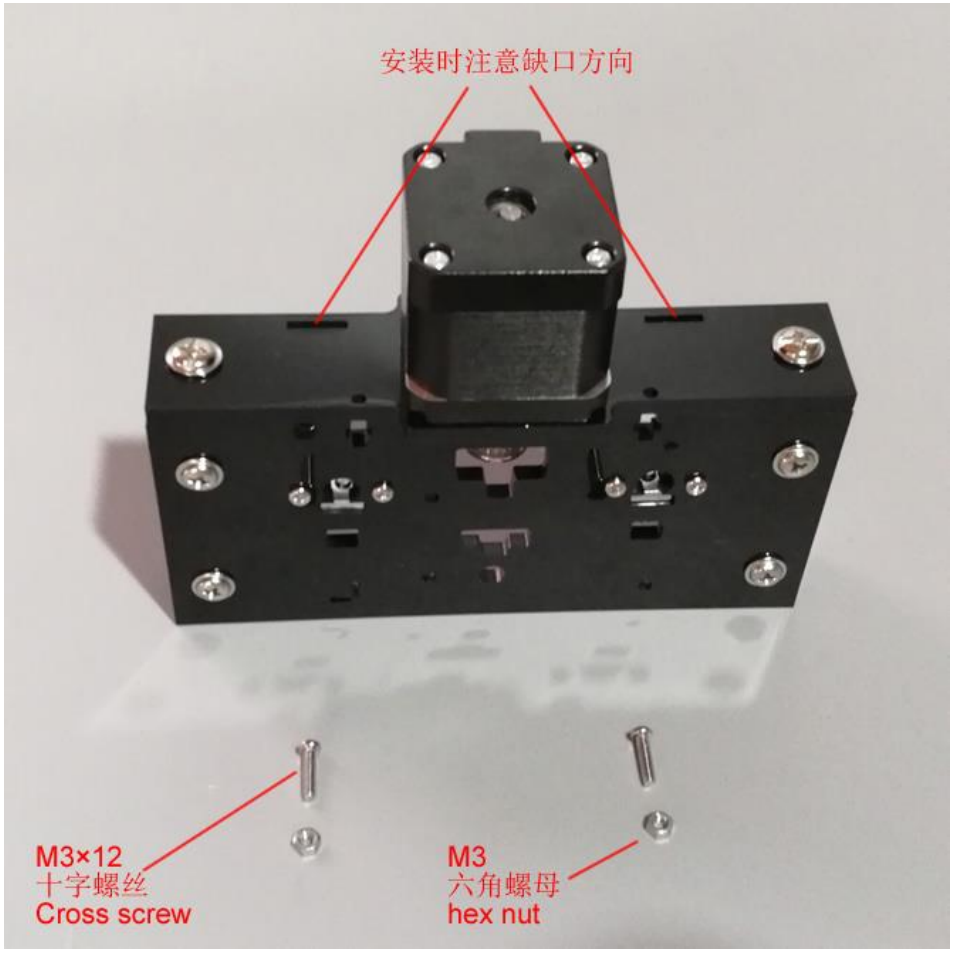

M5
铝型材螺母
AL profile nut
M5×10
十字螺丝
Cross screw

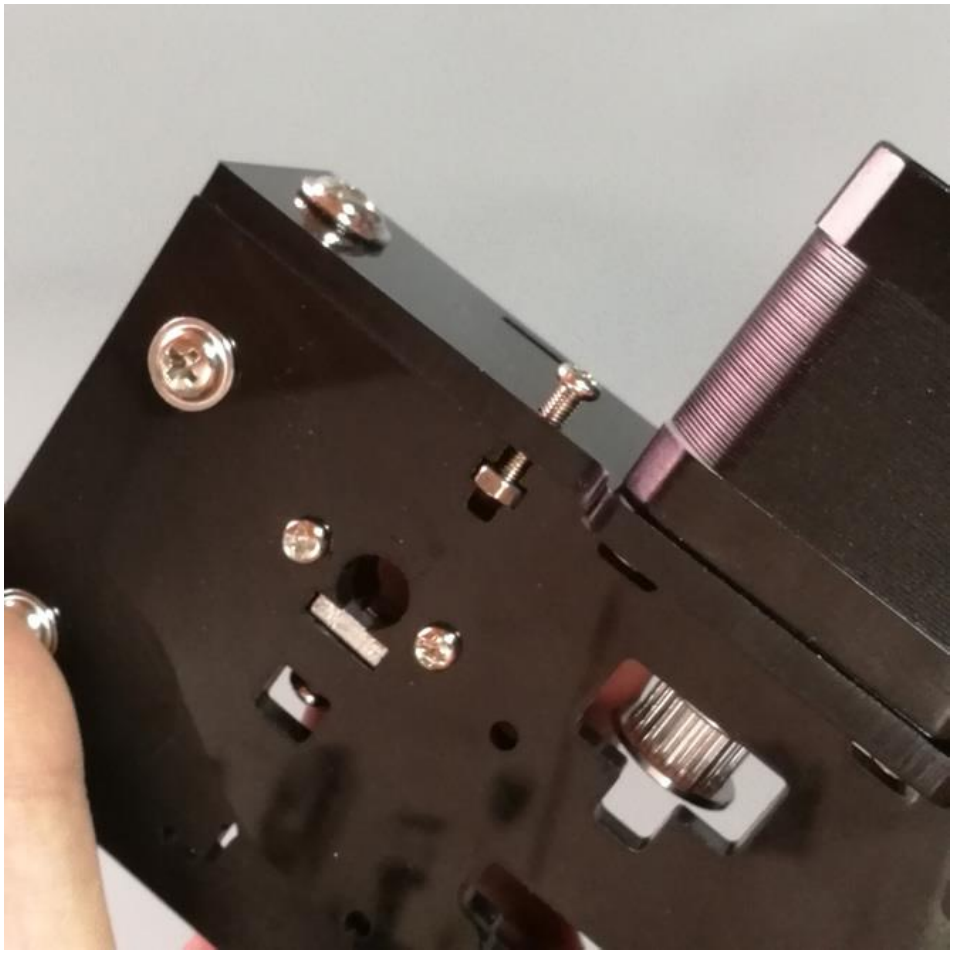

注意箭头方向
Caution!
有螺纹
Thread

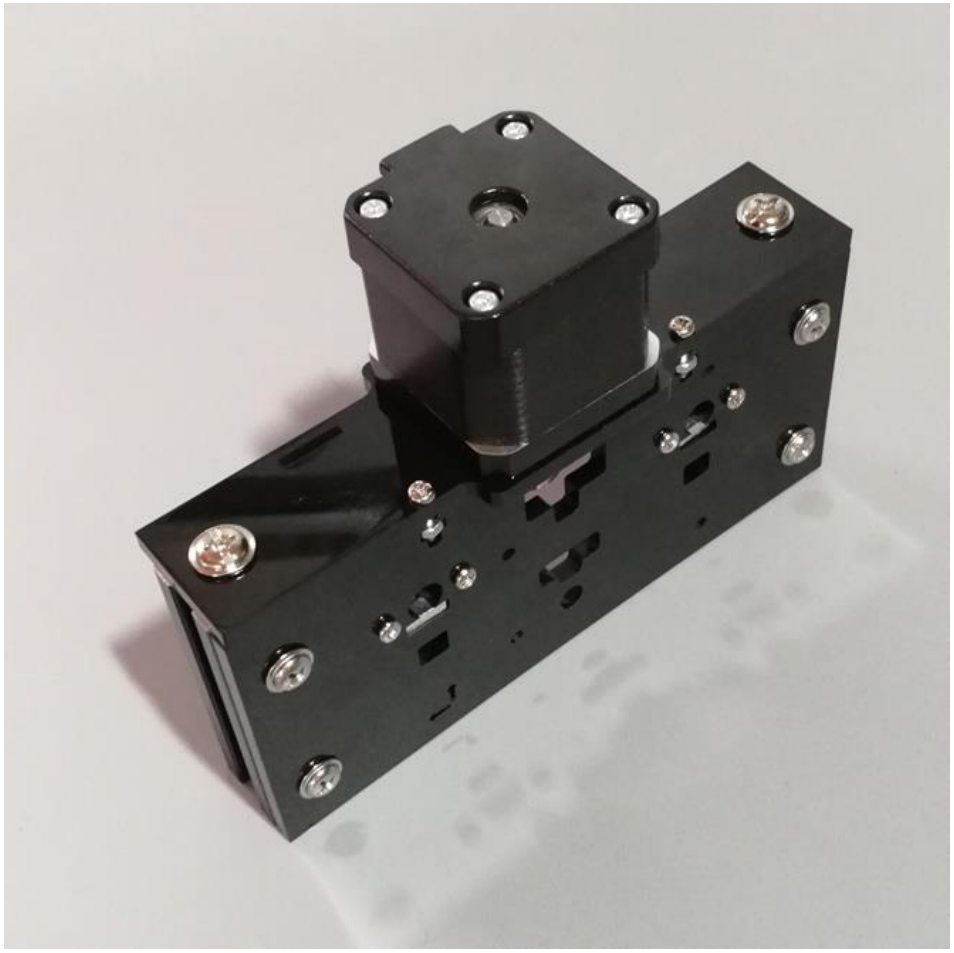

请确保铝型材螺孔面A与亚克力面B在同一平面
Please ensure that the aluminum profile screw hole surface A and acrylic surface B are in the same plane
A
B

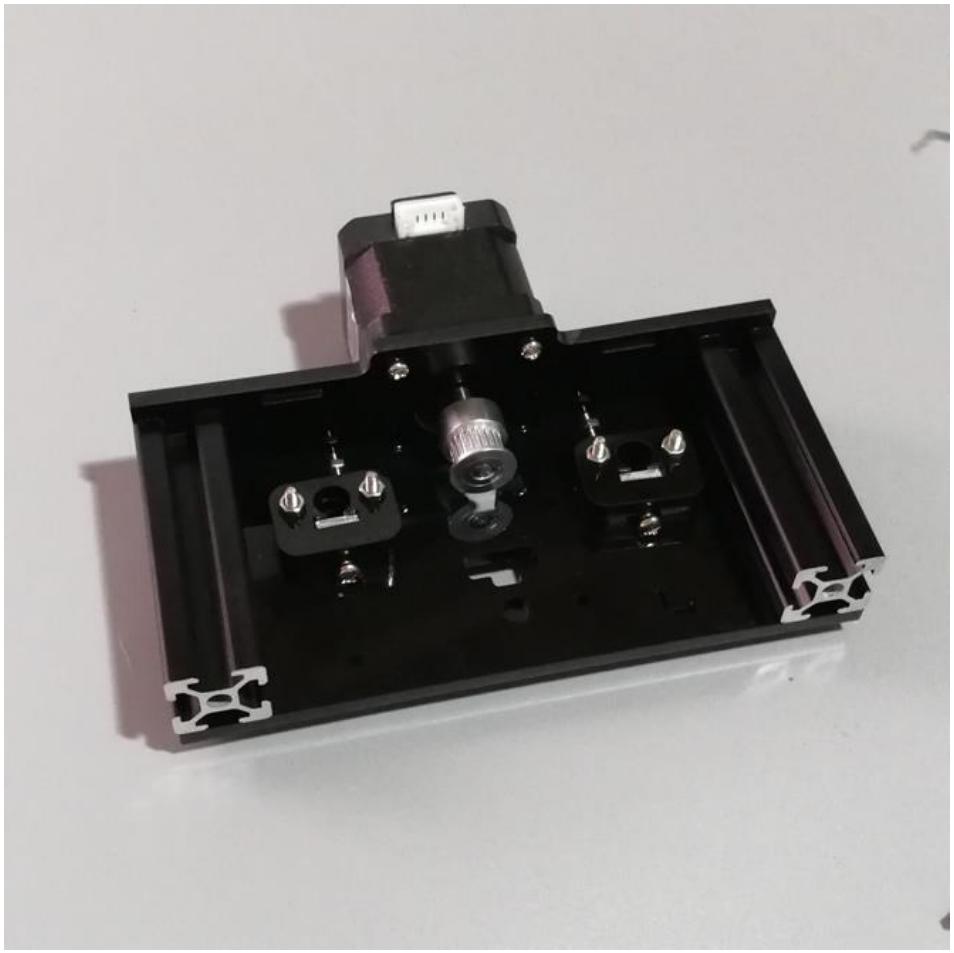

注意步进电机电线口与亚克力小方口在同一侧

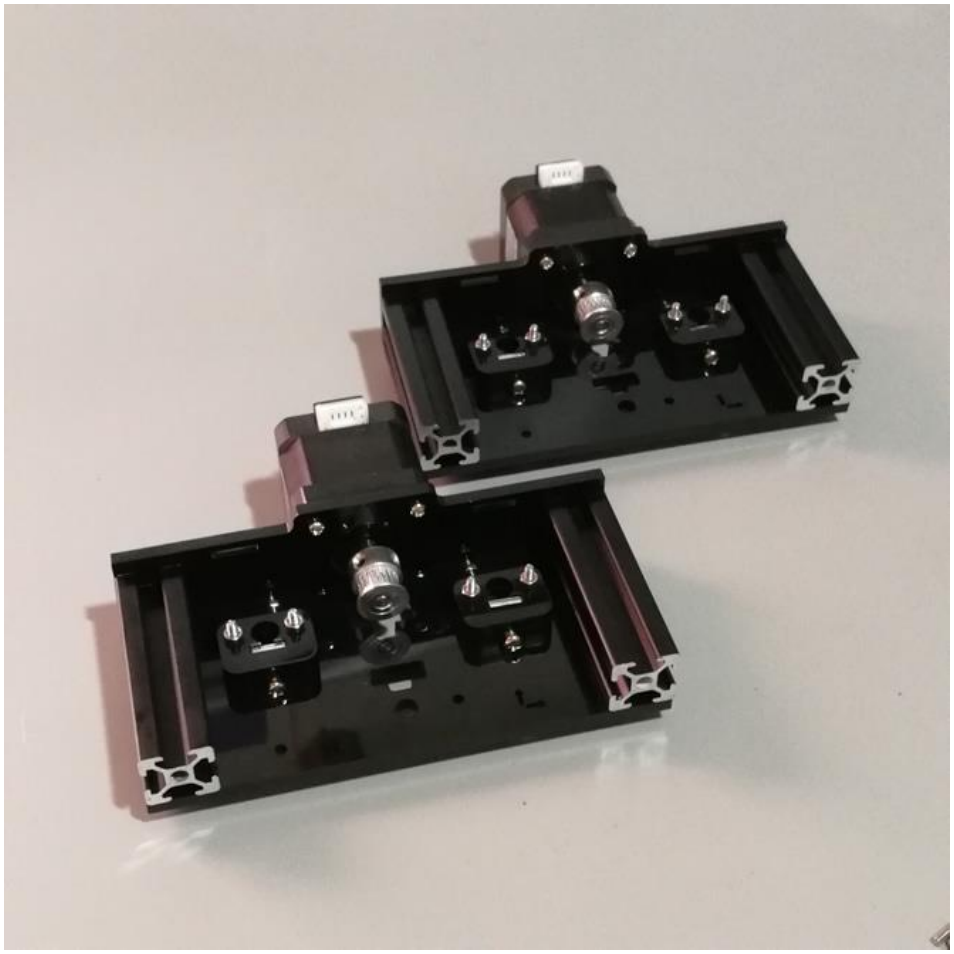

M6×12
十字螺丝
Cross screw


安装时注意缺口方向
M3×12
十字螺丝
Cross screw
M3
六角螺母
hex nut

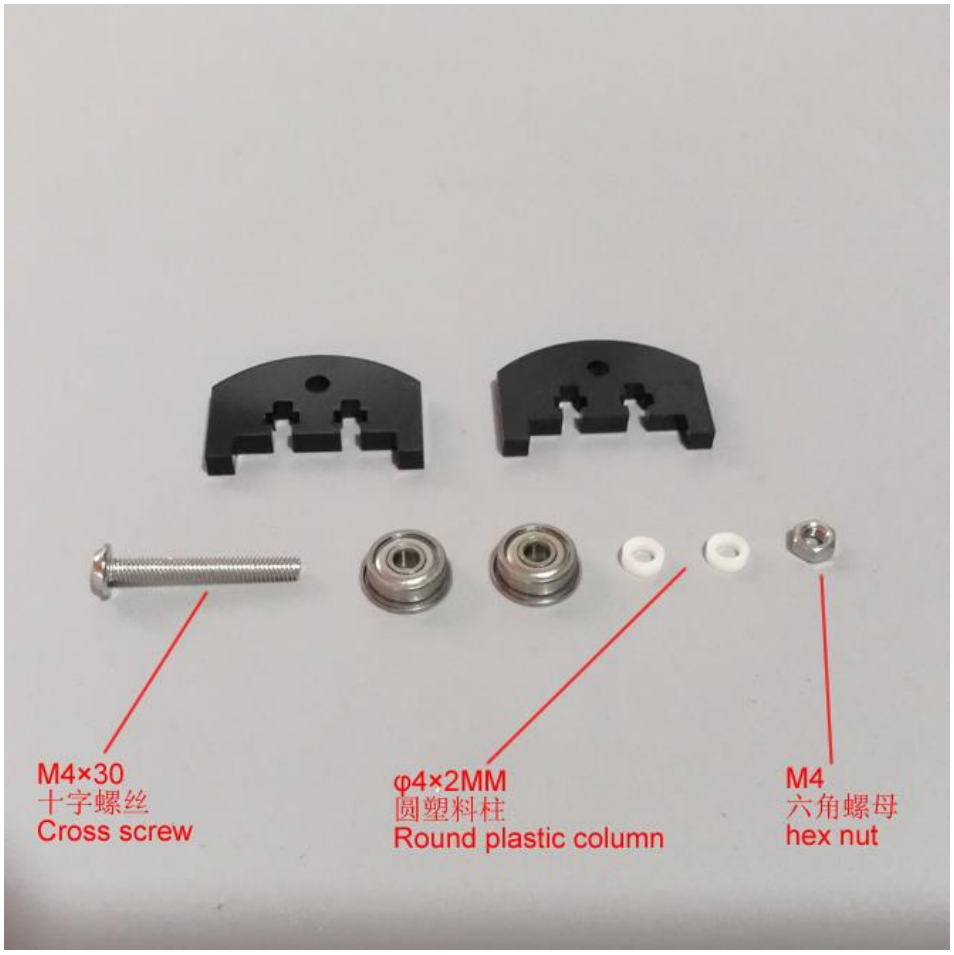


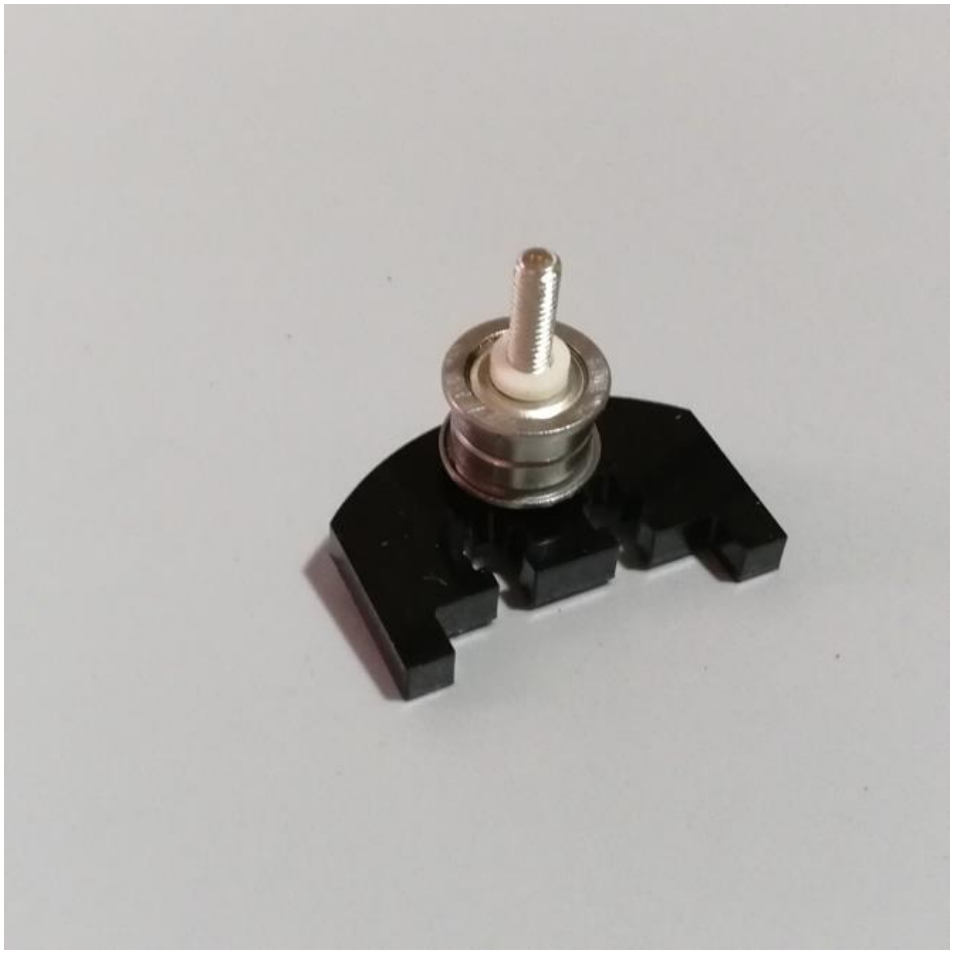


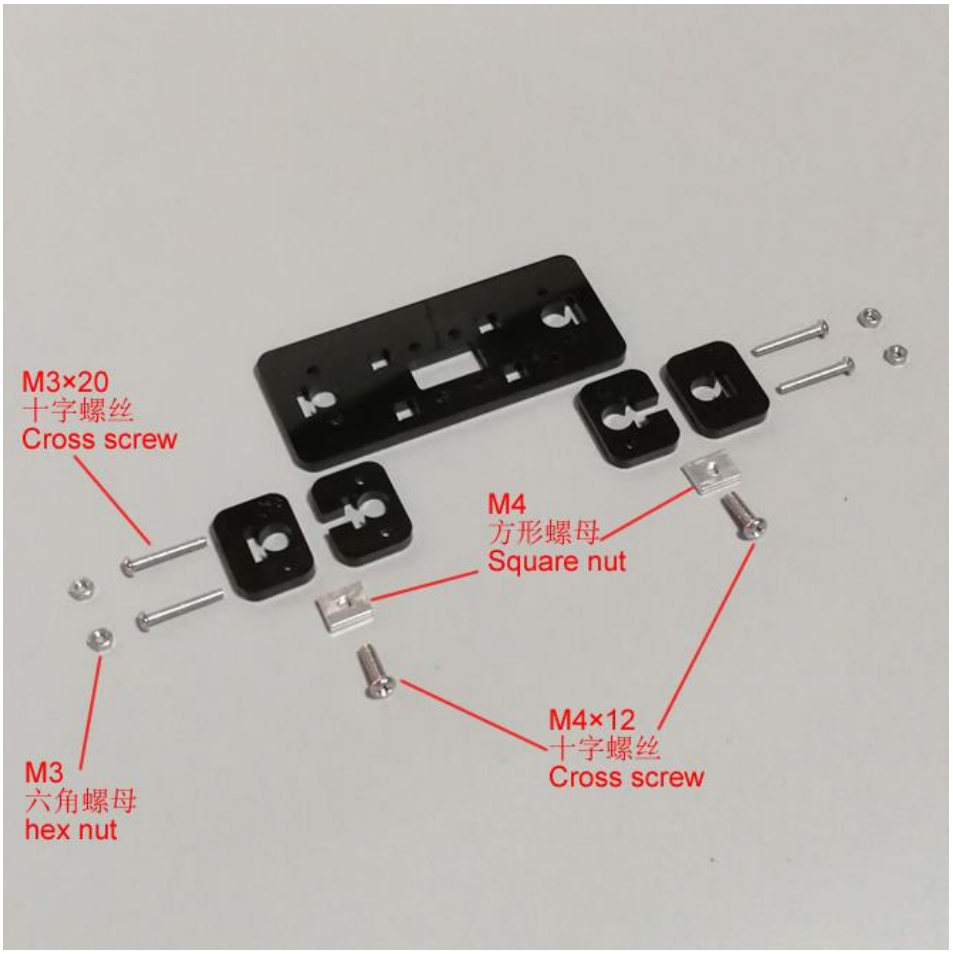


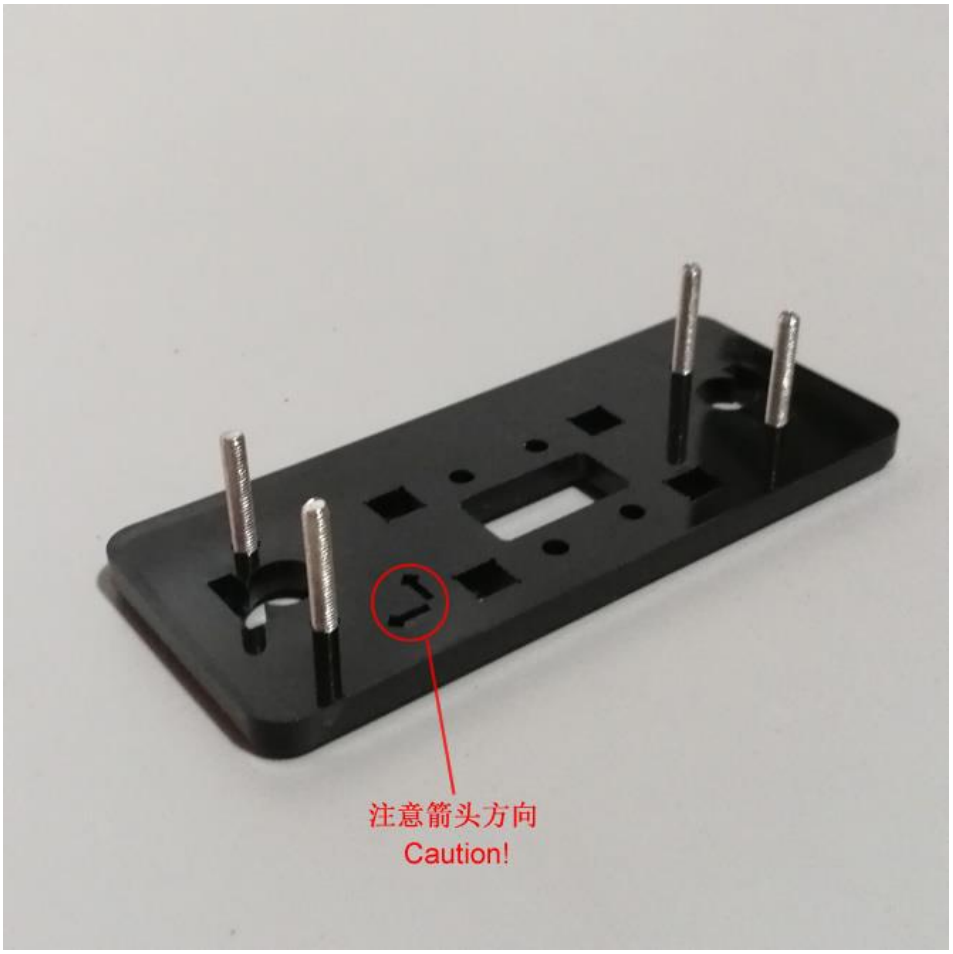


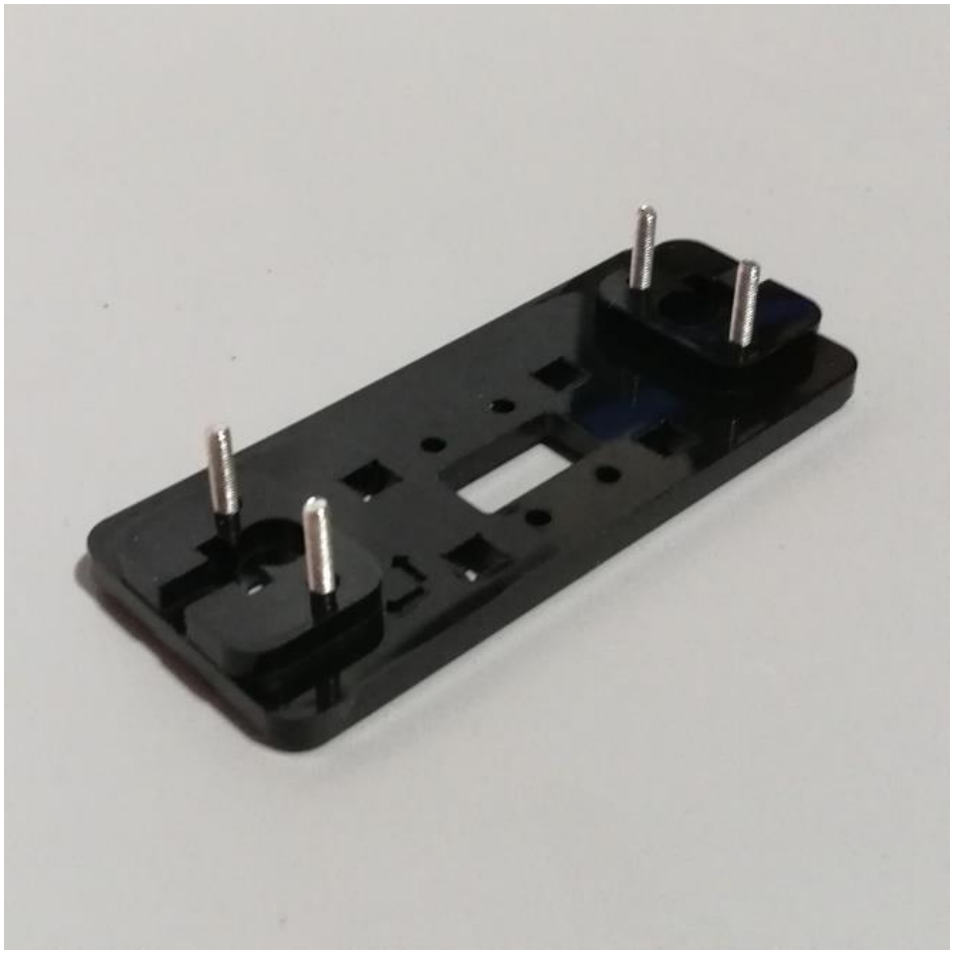
(3) Assembly rear optical axis mount

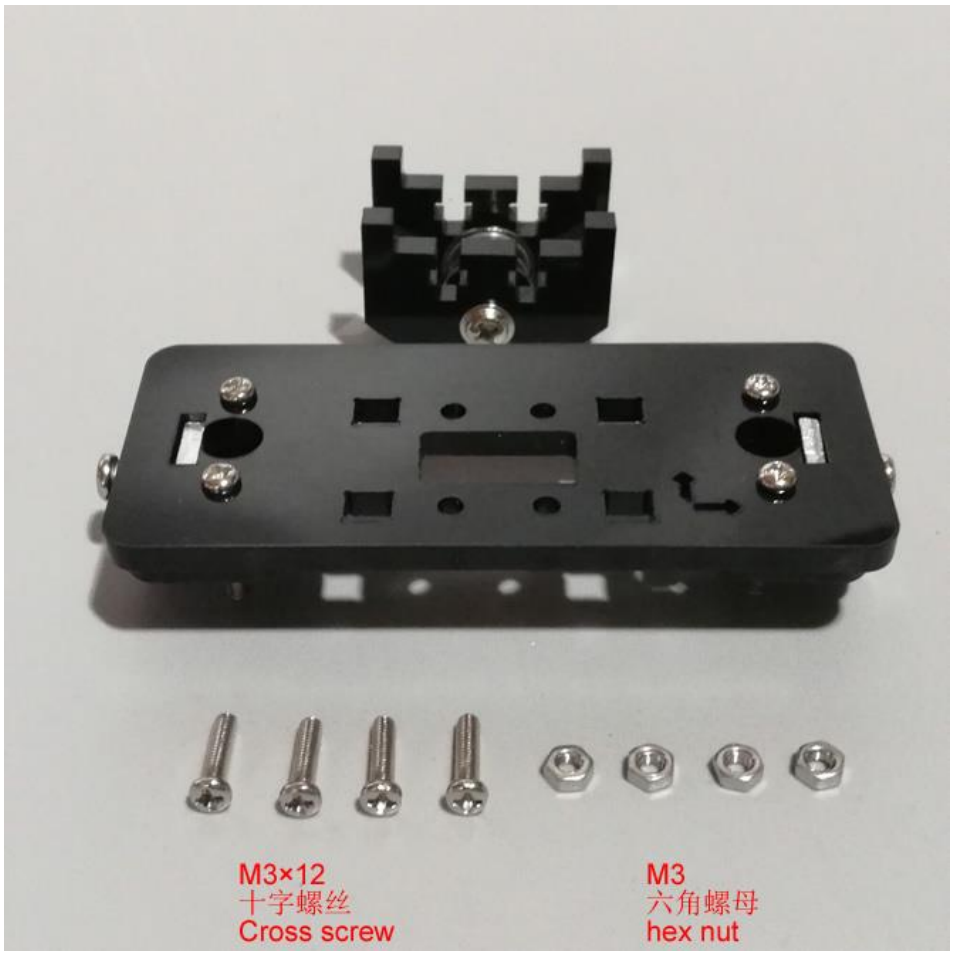


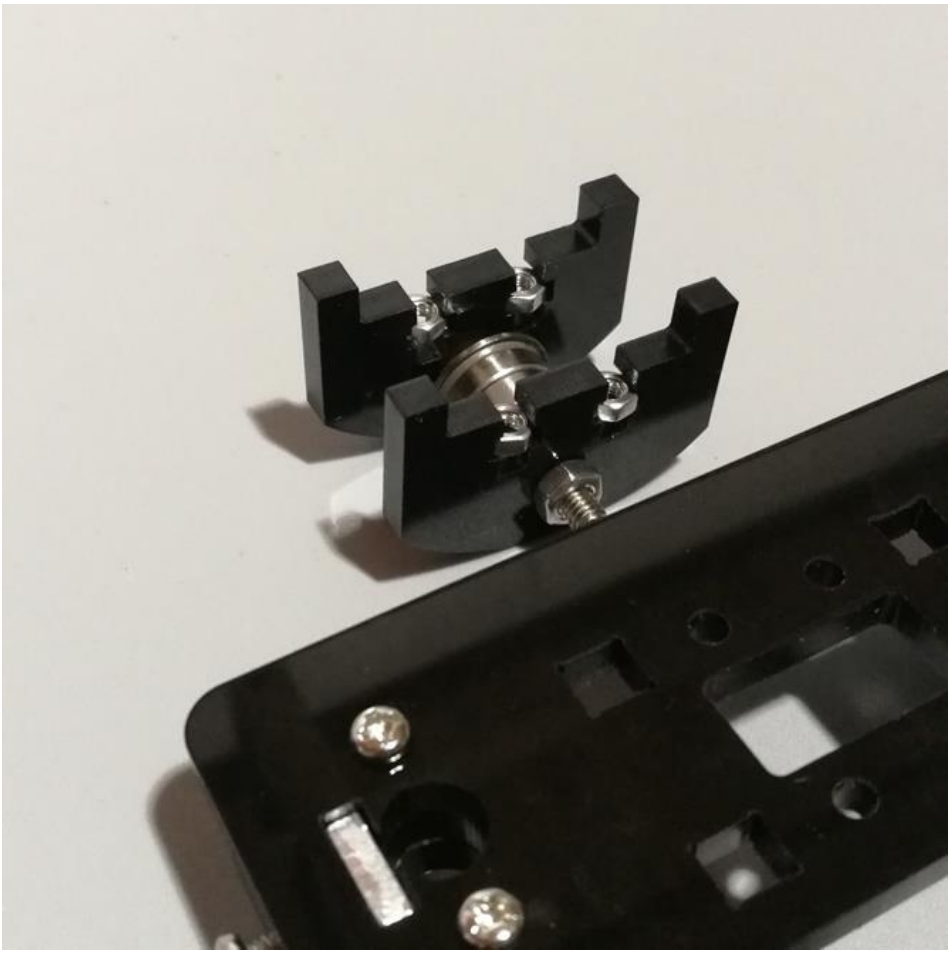



M3×20
十字螺丝
Cross screw
M4
方形螺母
Square nut
M3
六角螺母
hex nut
M4×12
十字螺丝
Cross screw

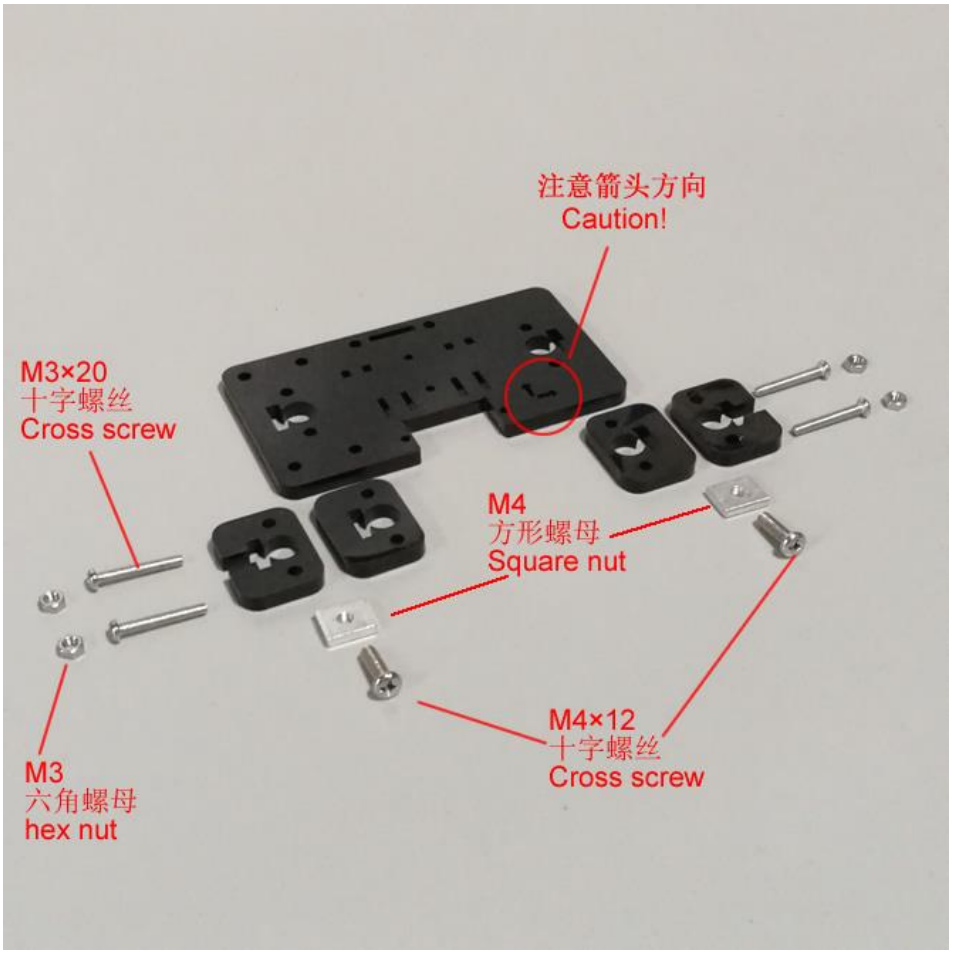

注意箭头方向
Caution!

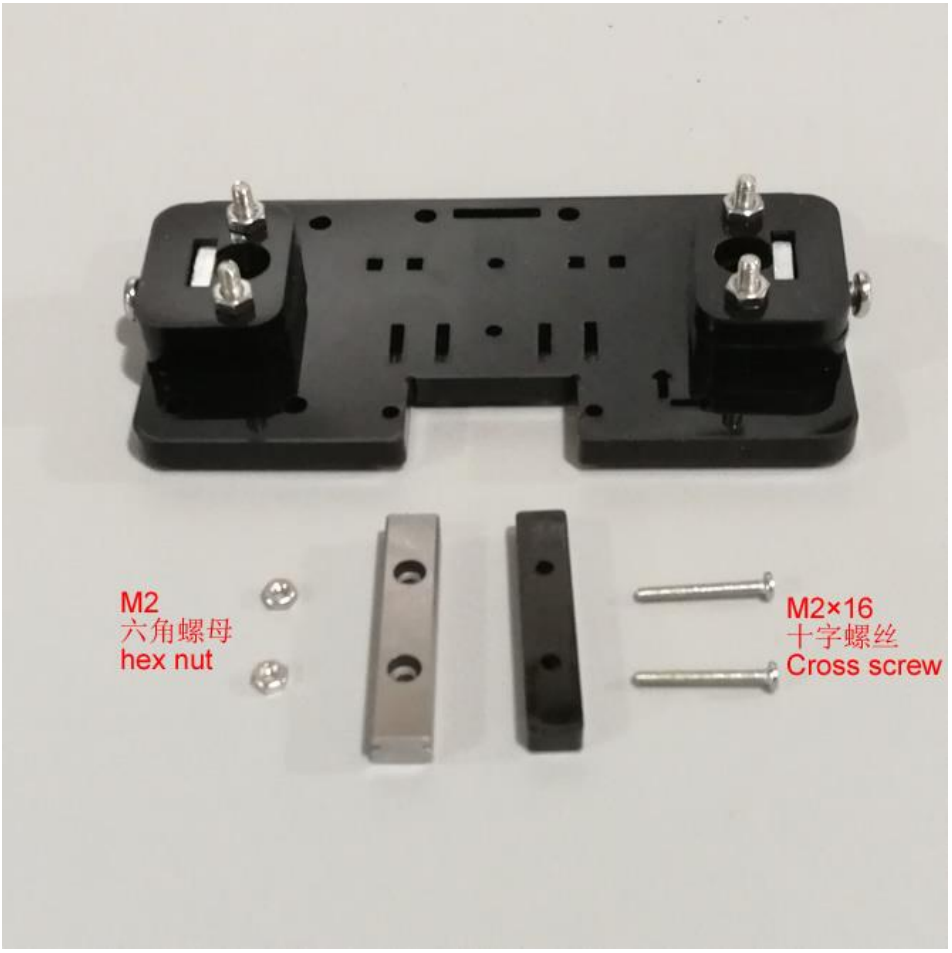


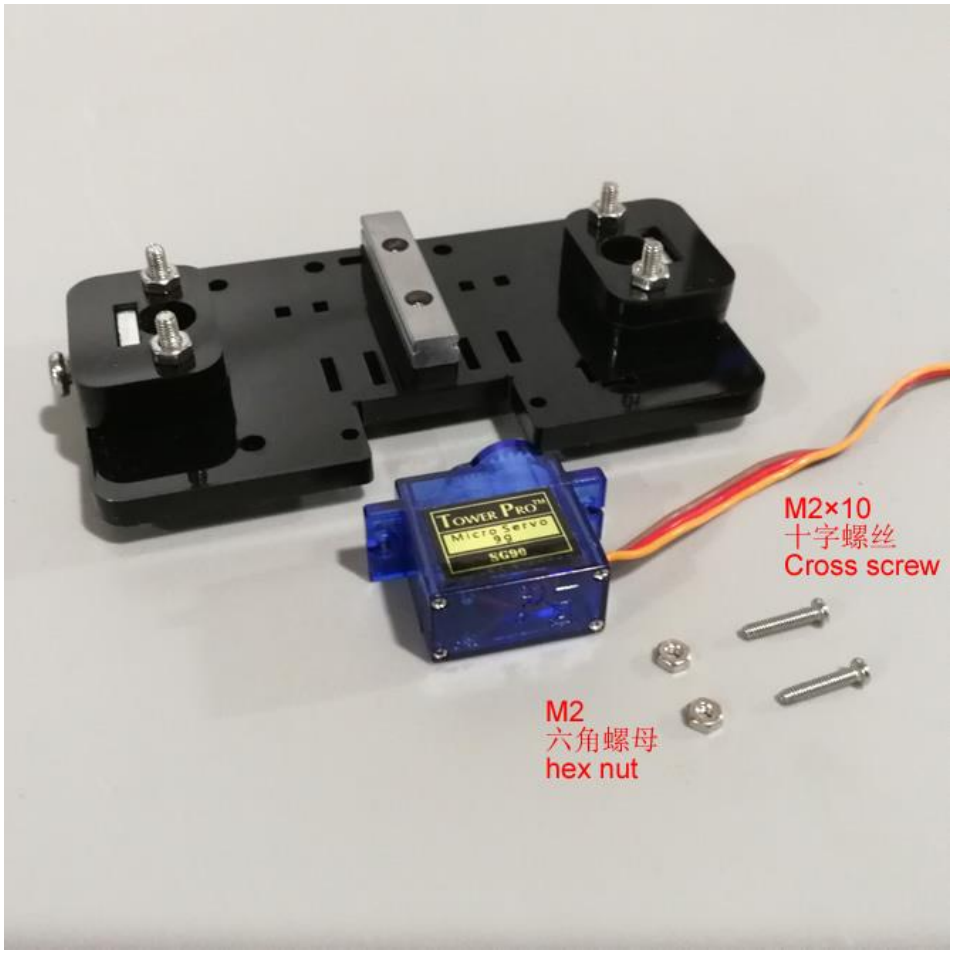

M3×12
十字螺丝
Cross screw
M3
六角螺母
hex nut

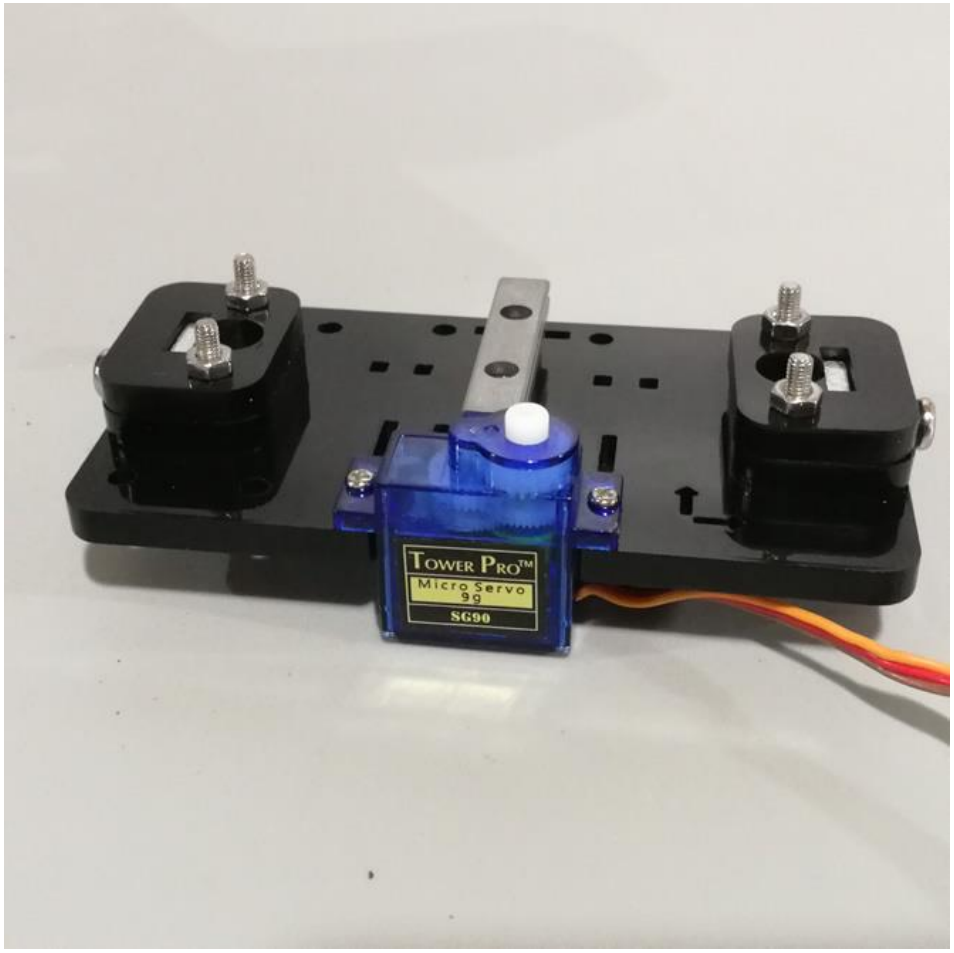


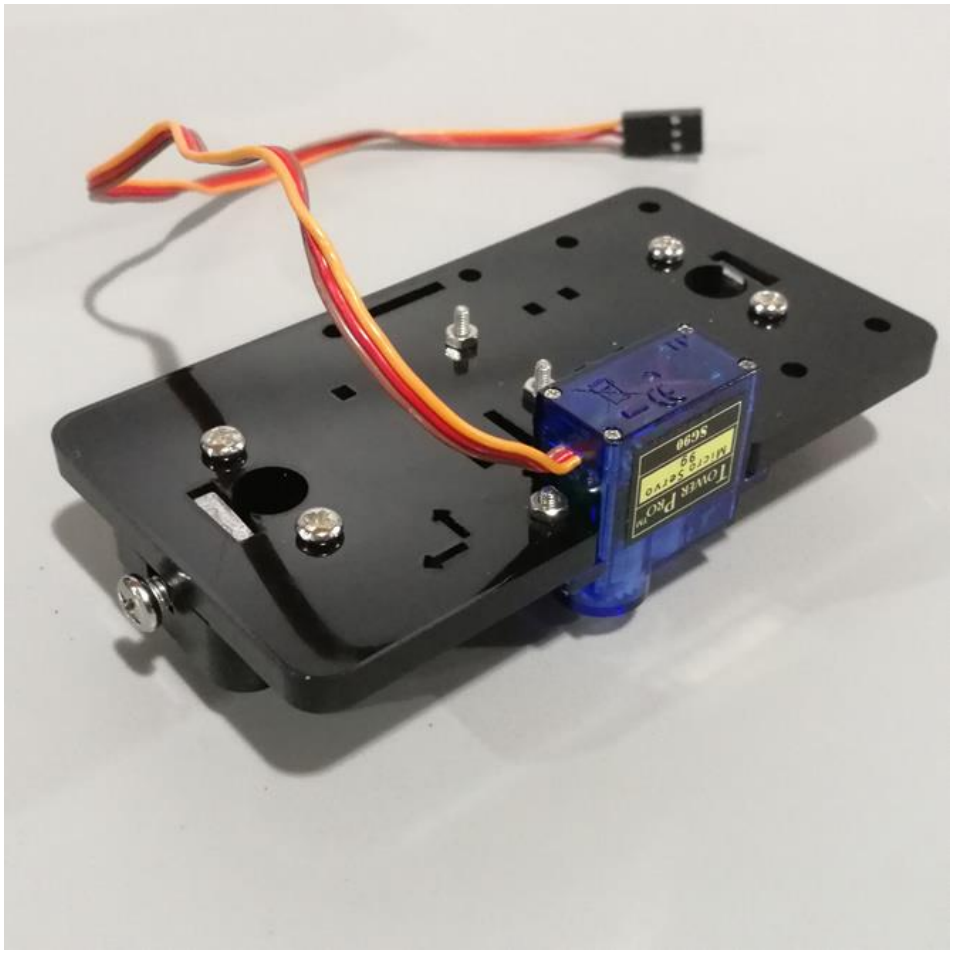
(4) Assembly front optical axis mount



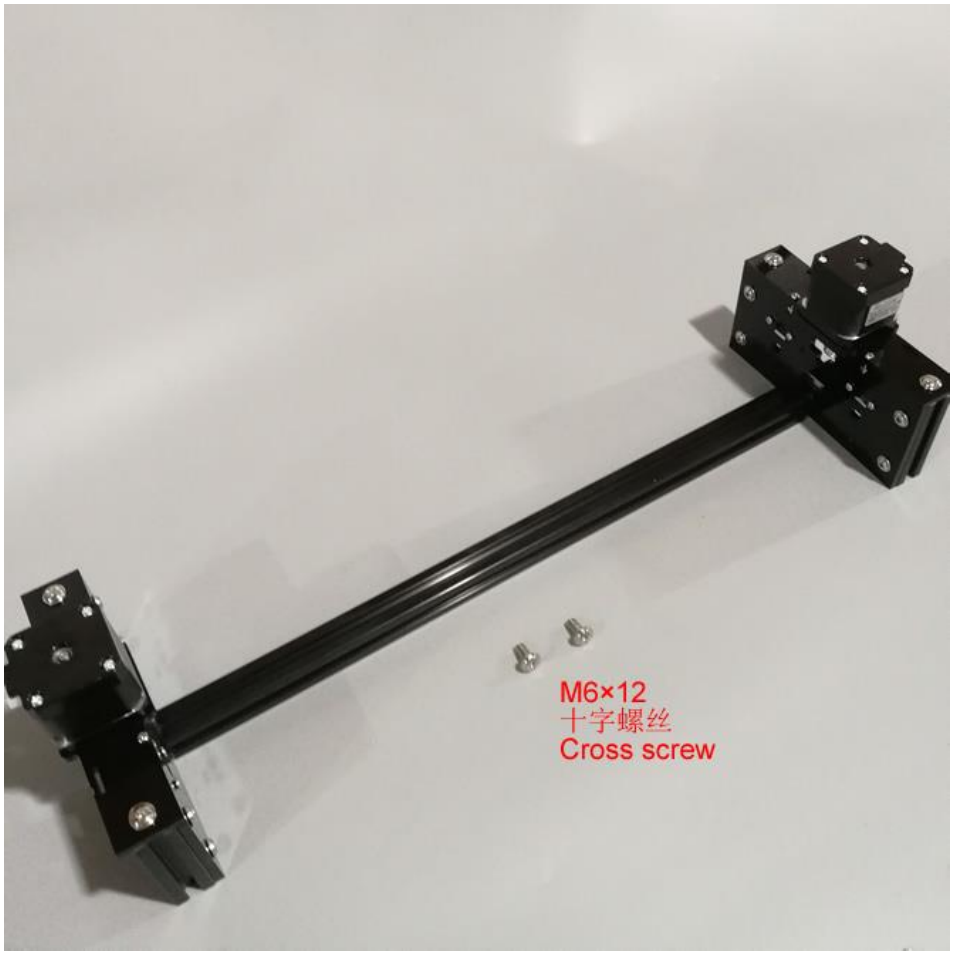

M2
六角螺母
hex nut
M2×16
十字螺丝
Cross screw

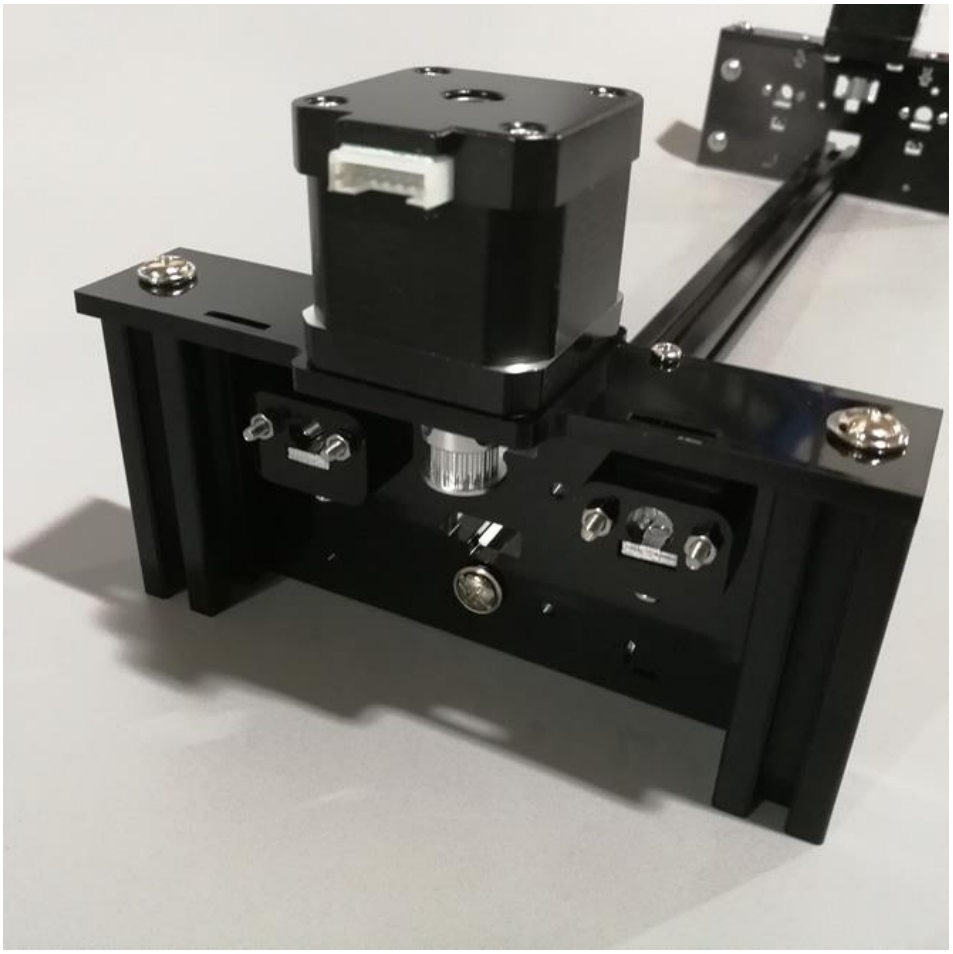

TOWER PRO™
Micro Servo
9g
SG90
M2×10
十字螺丝
Cross screw
M2
六角螺母
hex nut

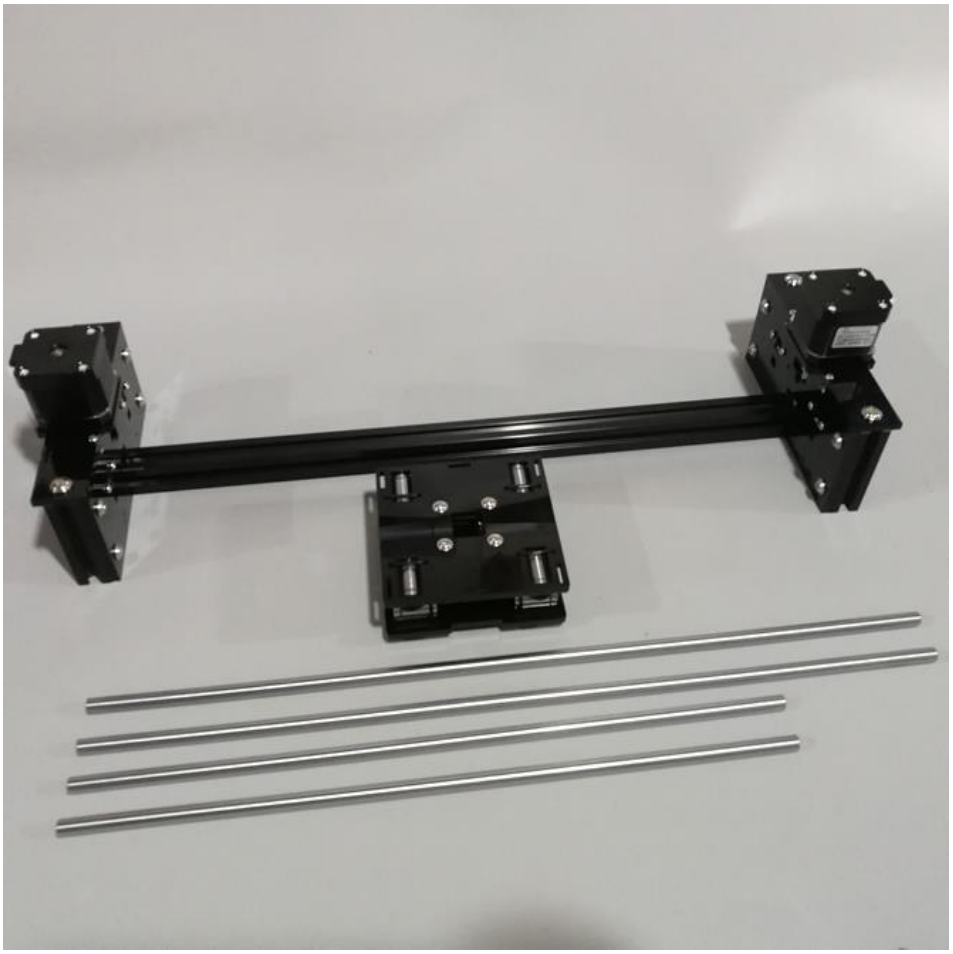

TOWER PRO™
Micro Servo
9g
SG90

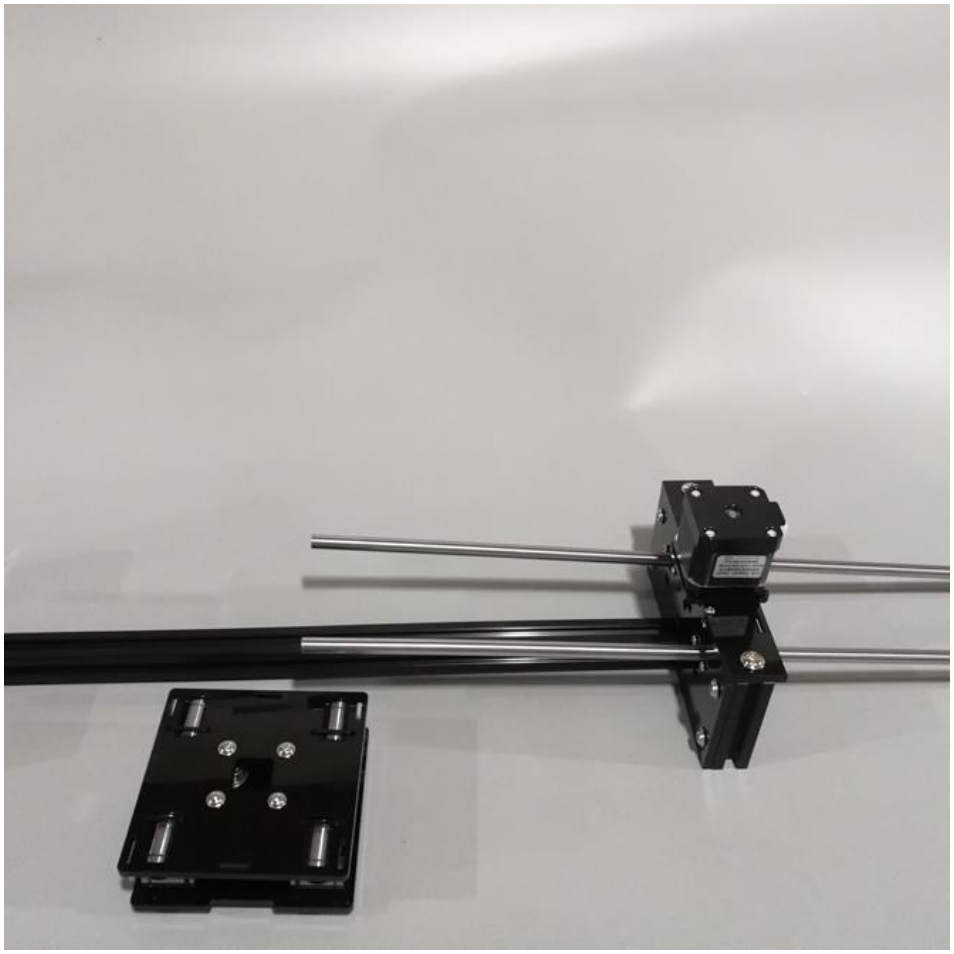


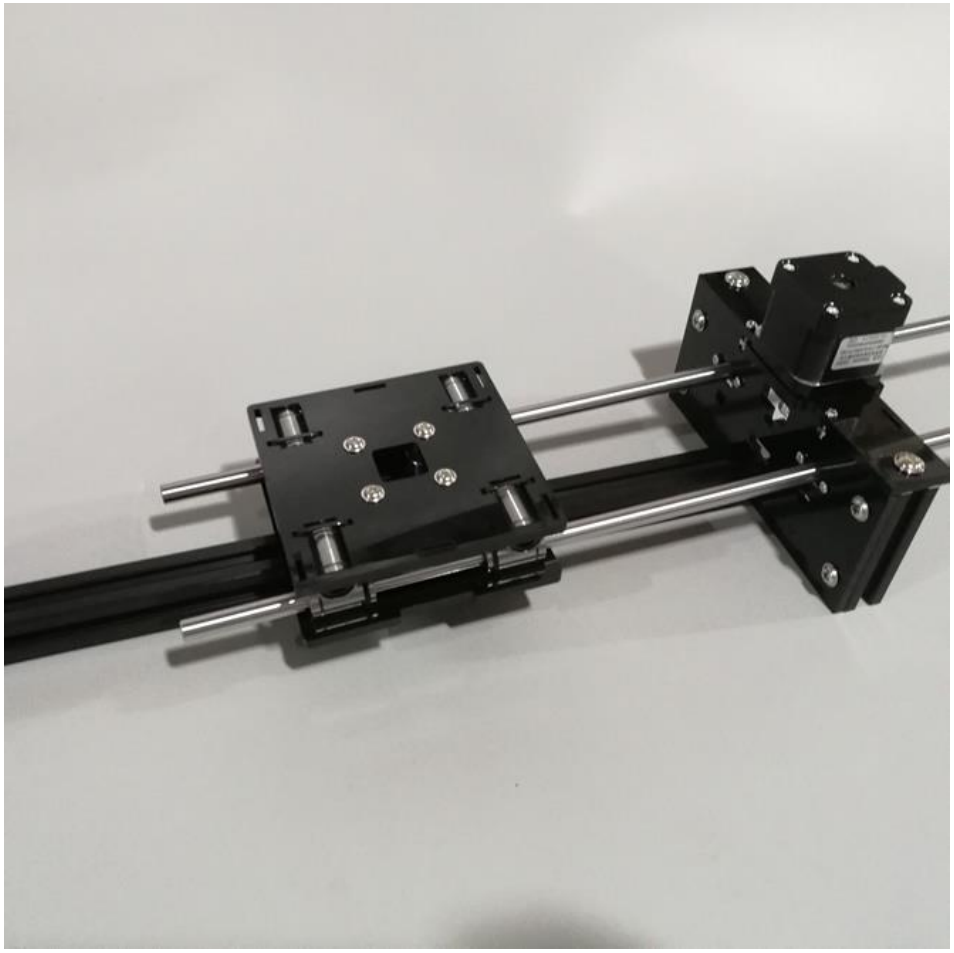
(5) Assembly rack

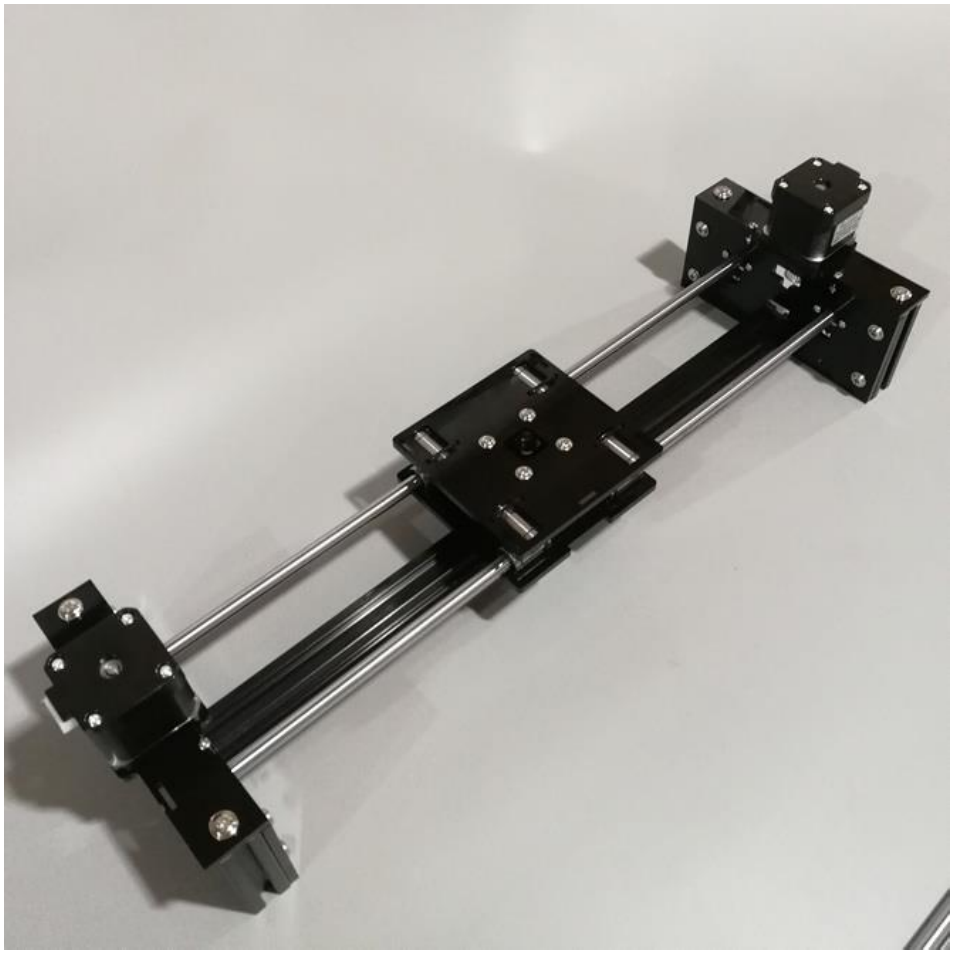


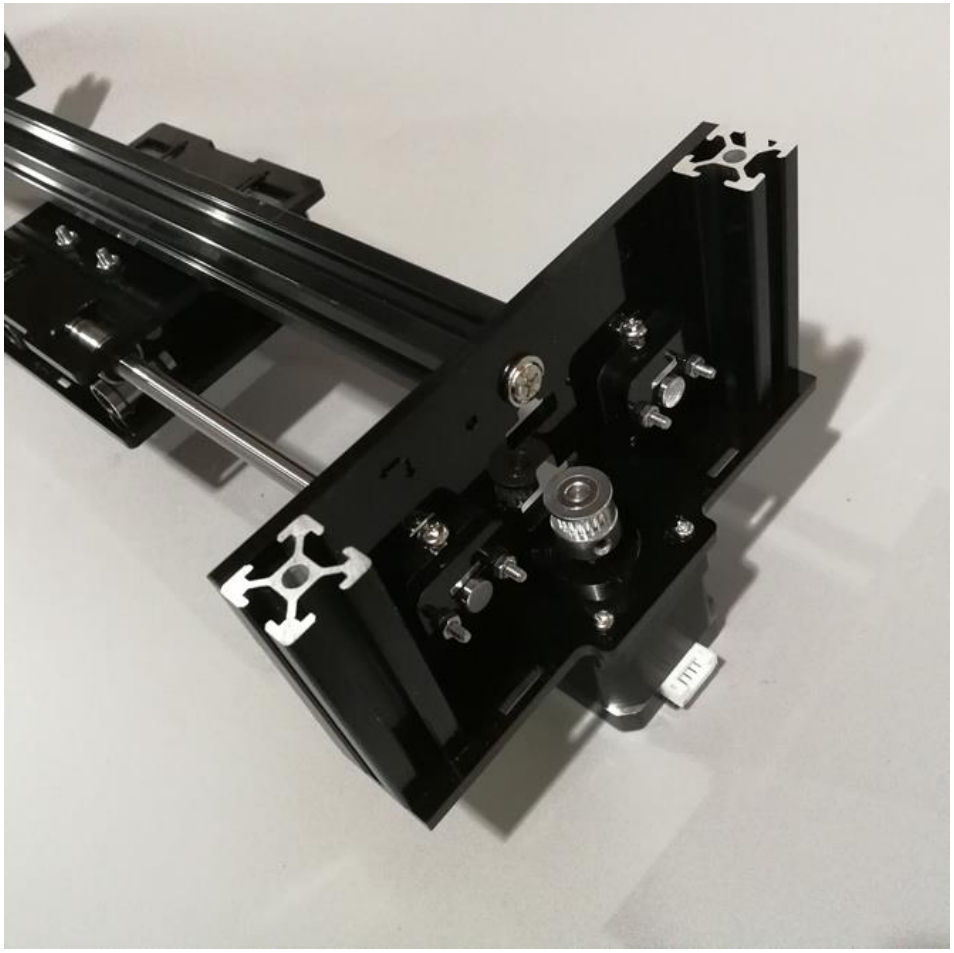


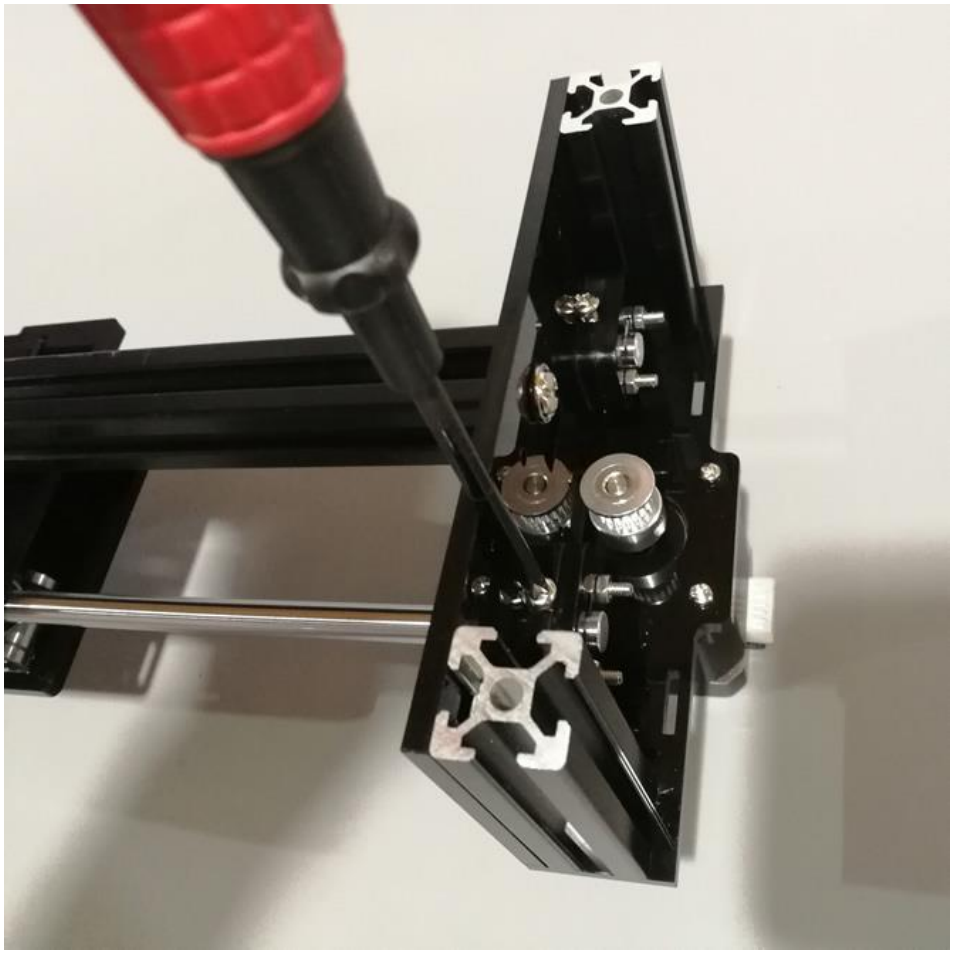


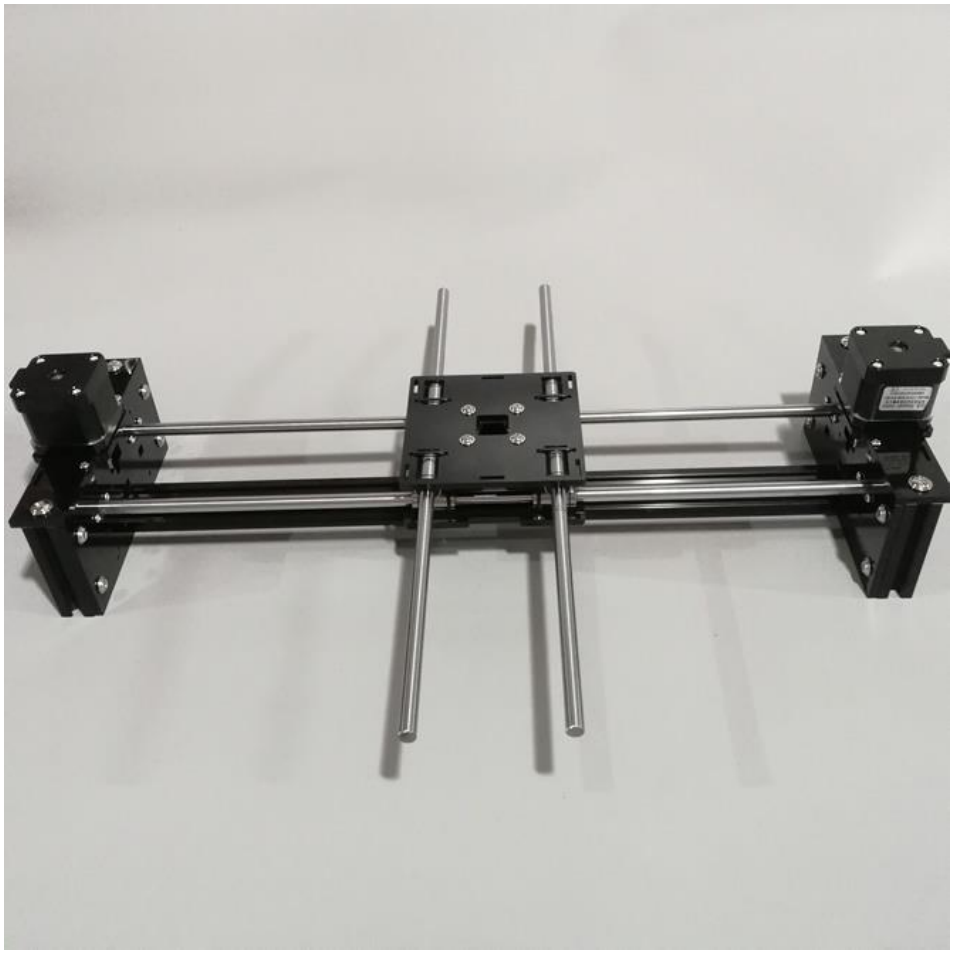


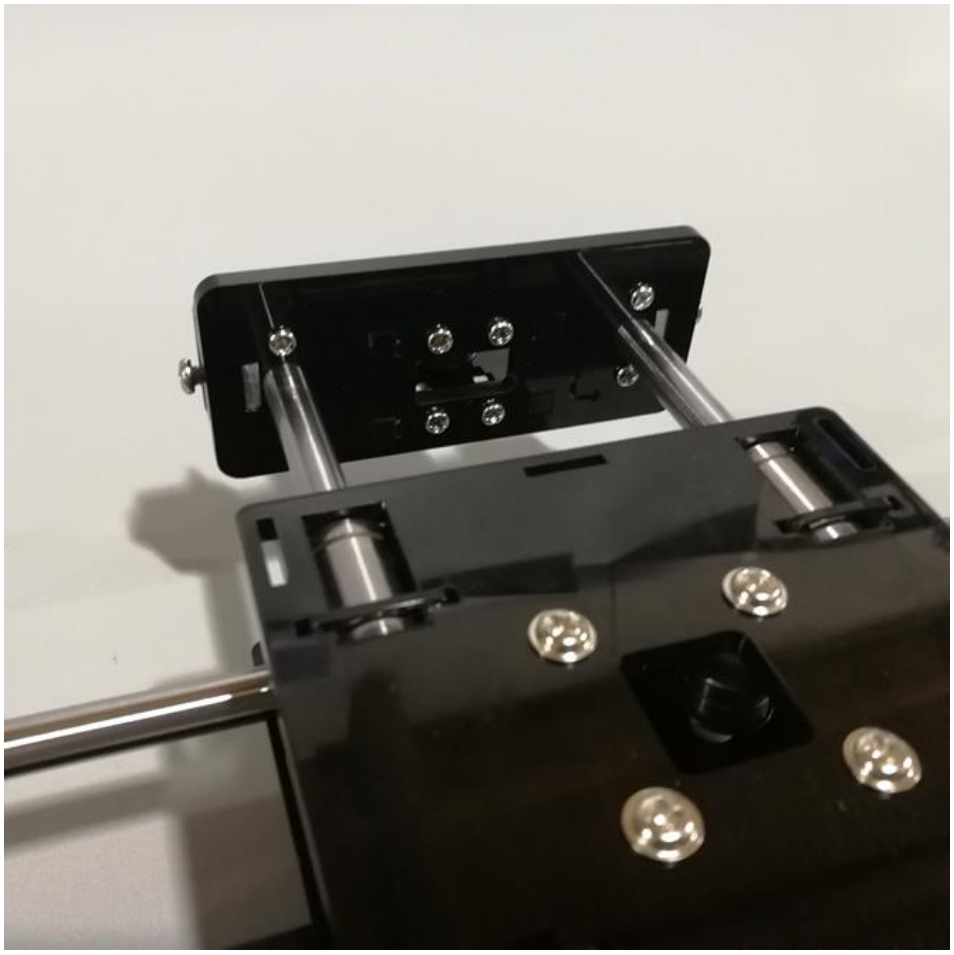


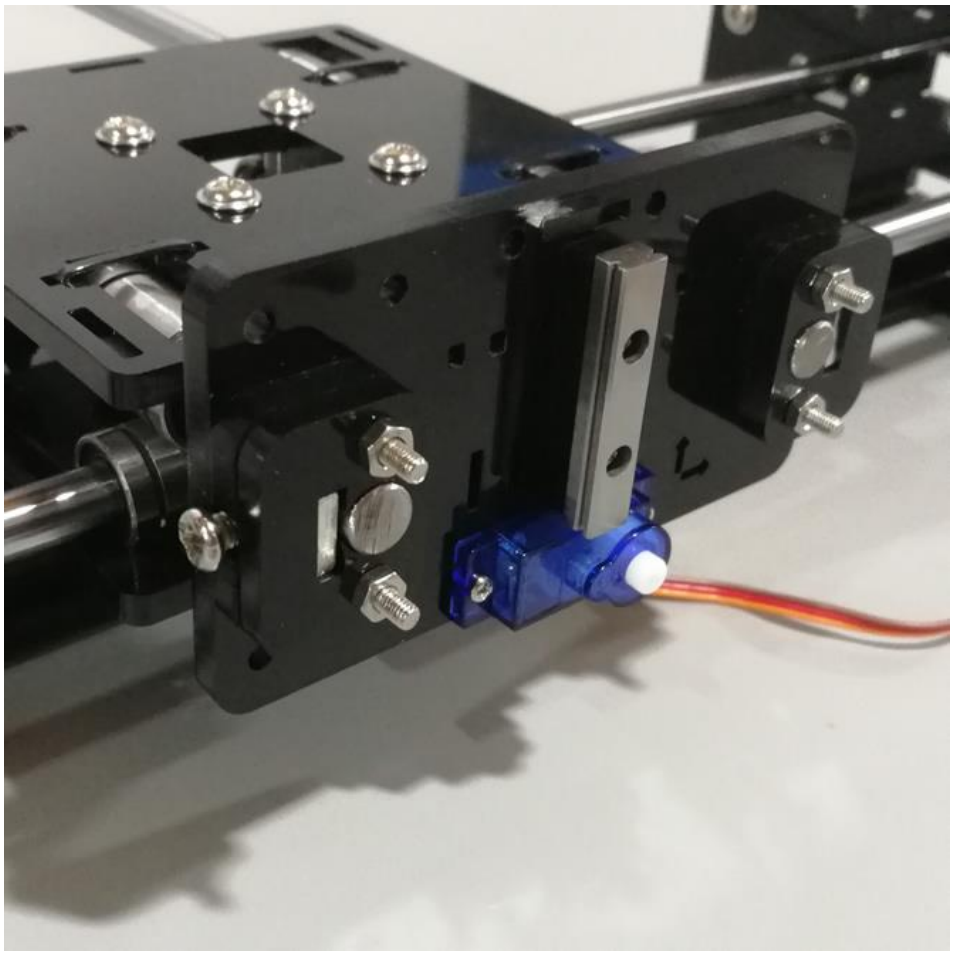




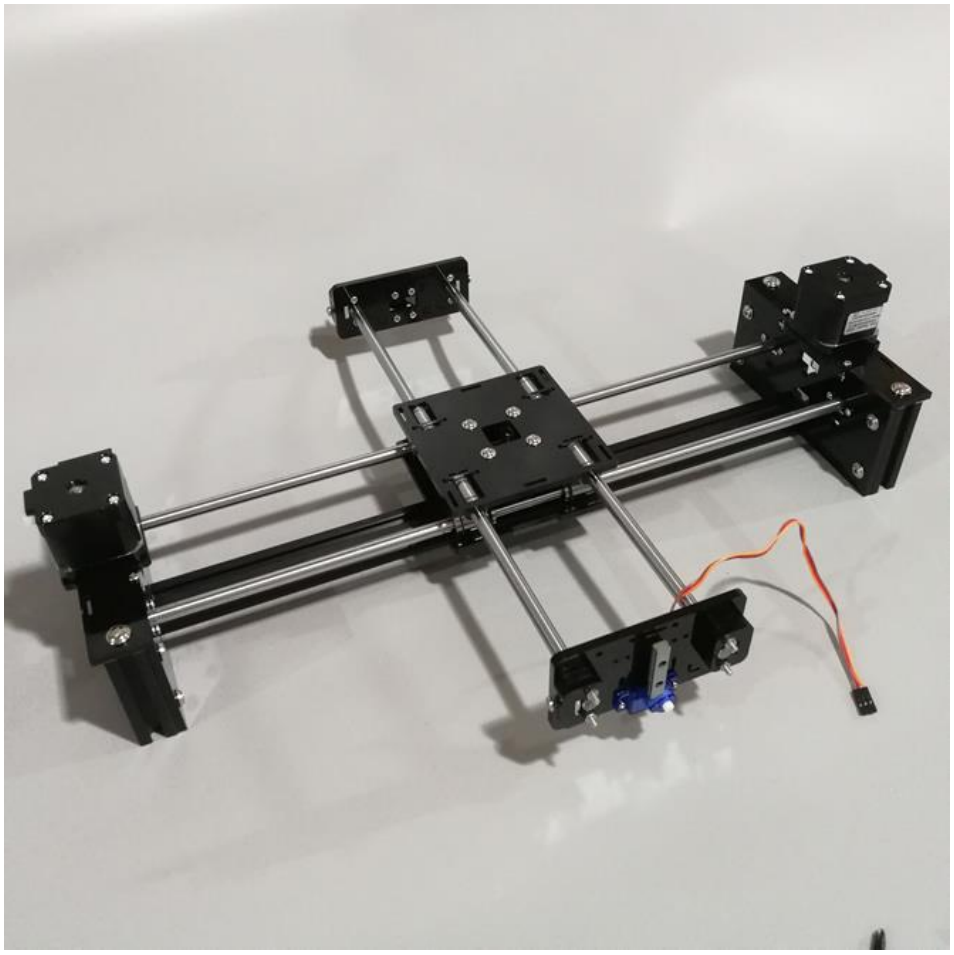






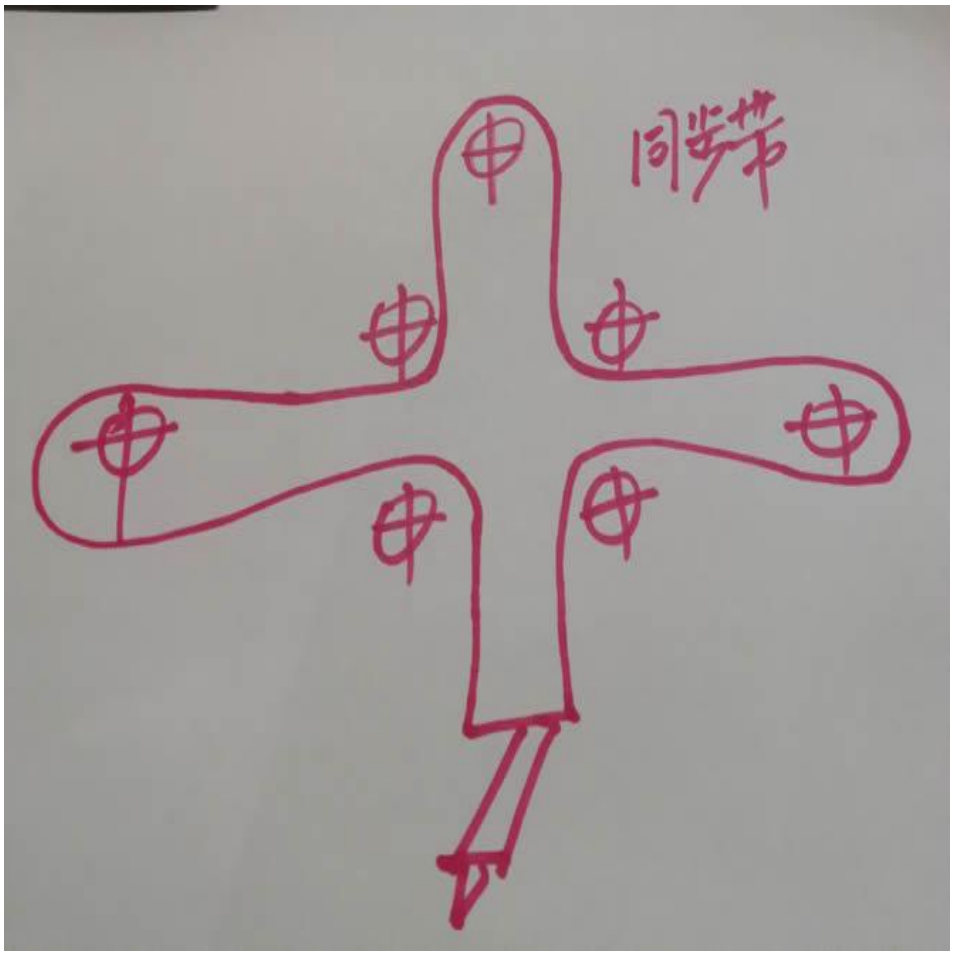


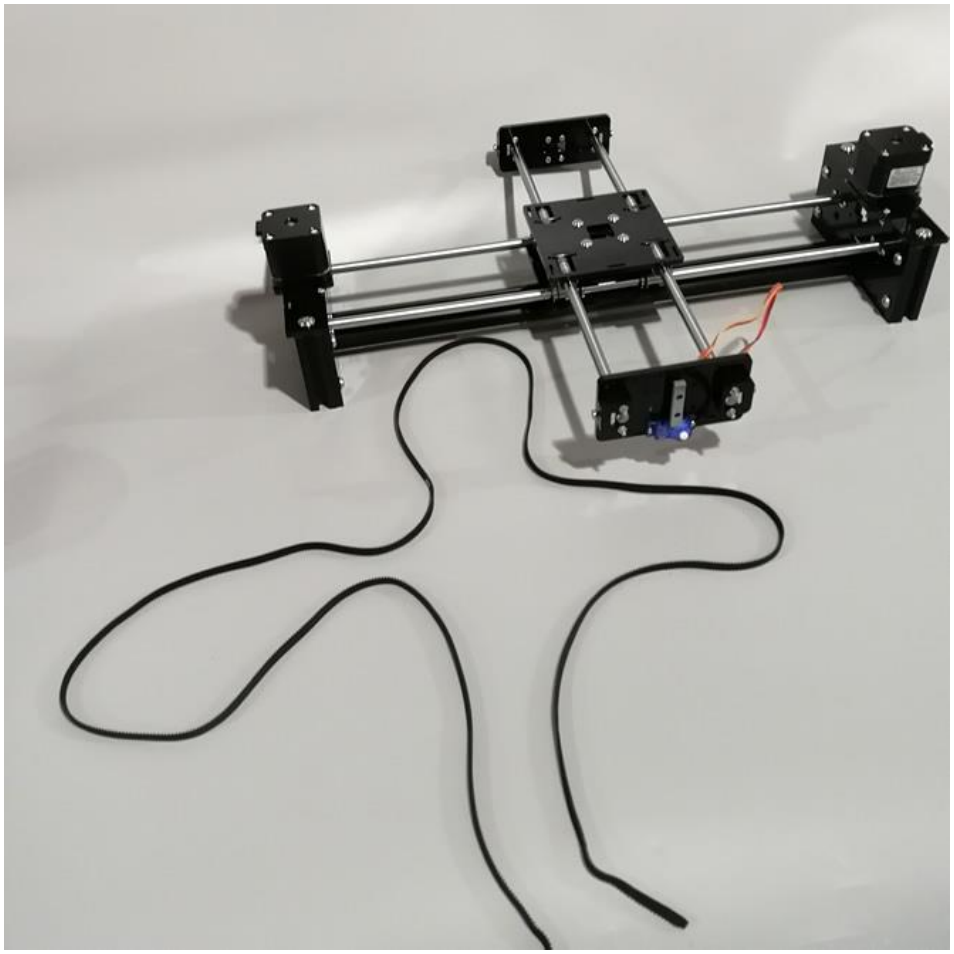
The pen holder is assembled

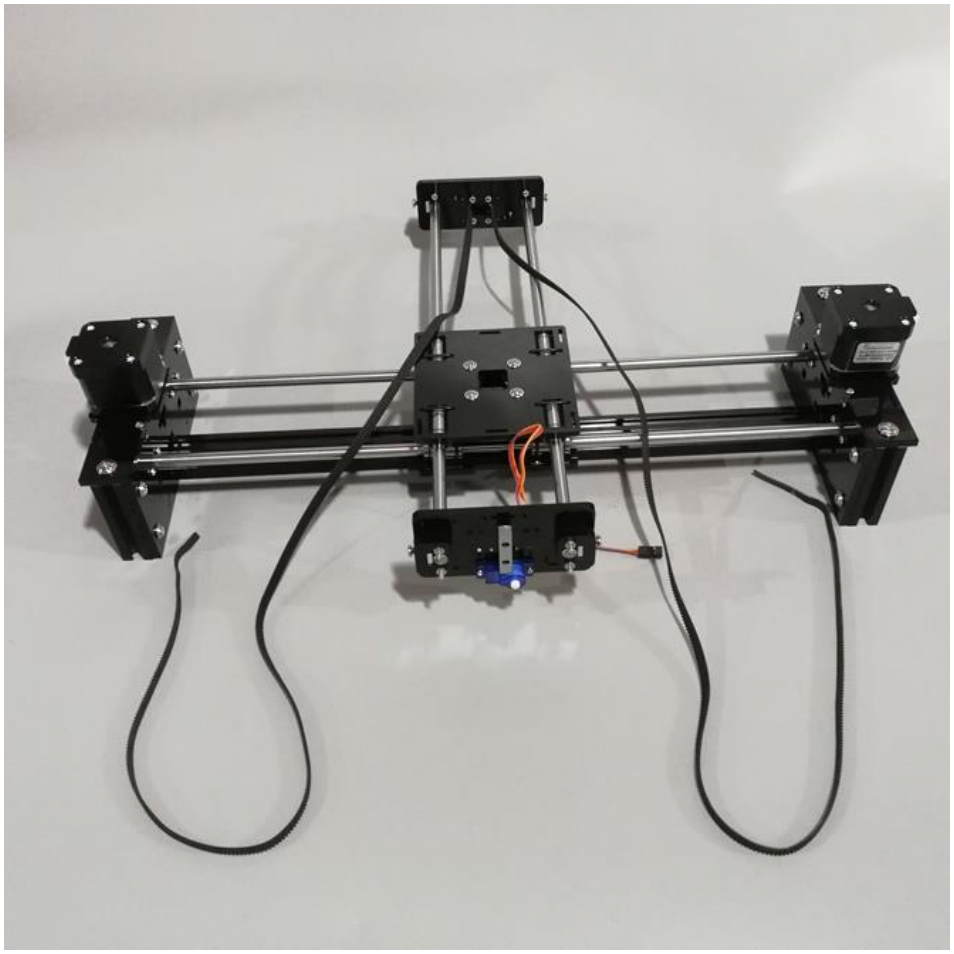


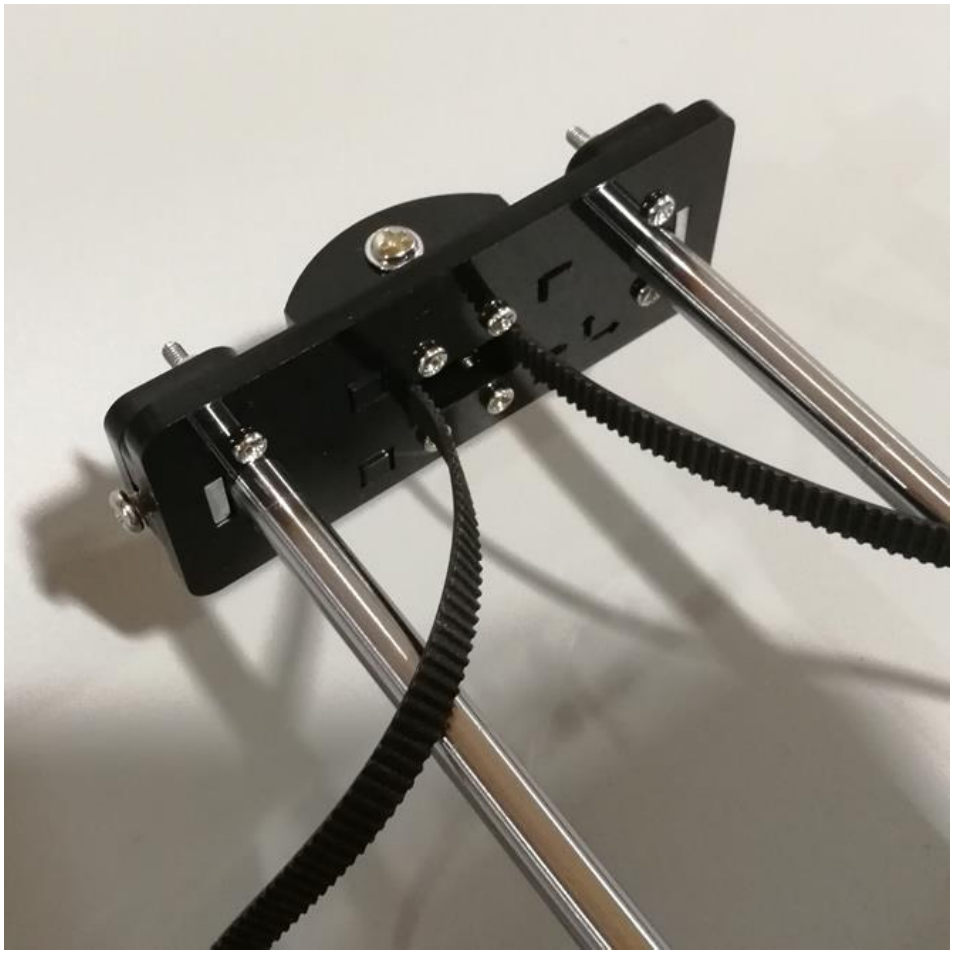
(6) Installation of synchronous belt

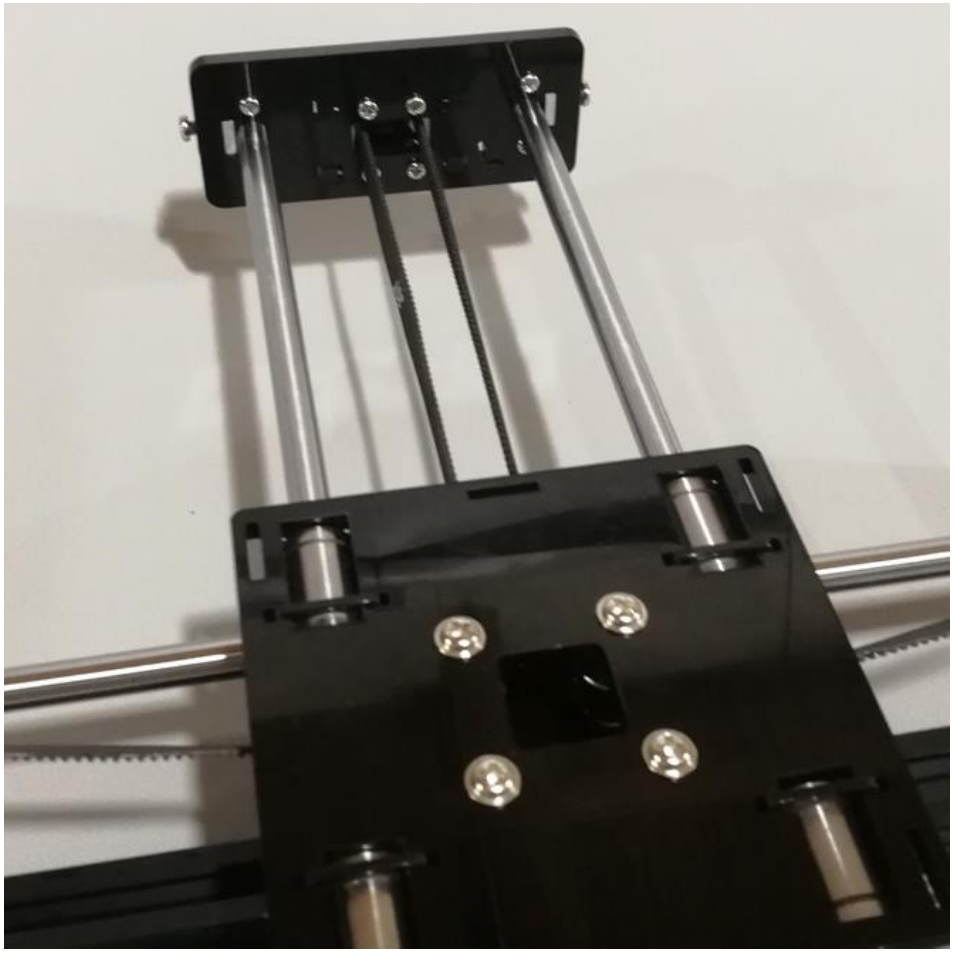
This is the synchronous belt winding reference map

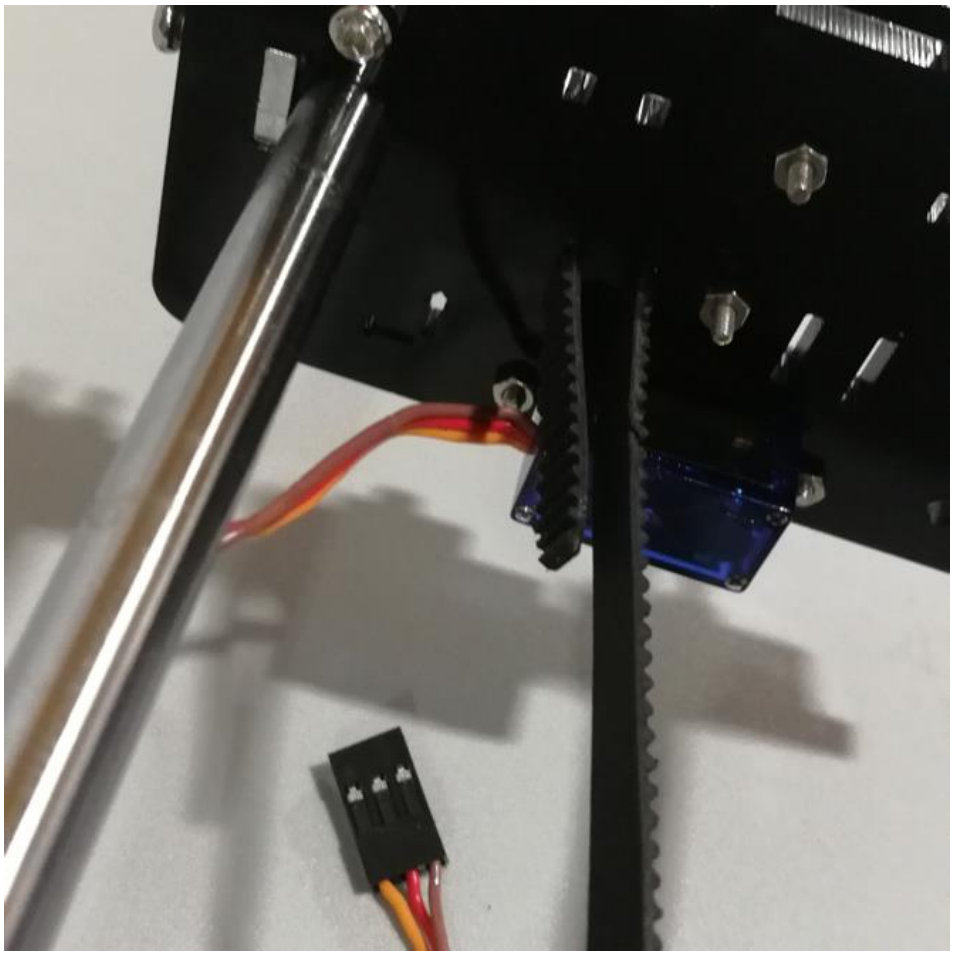


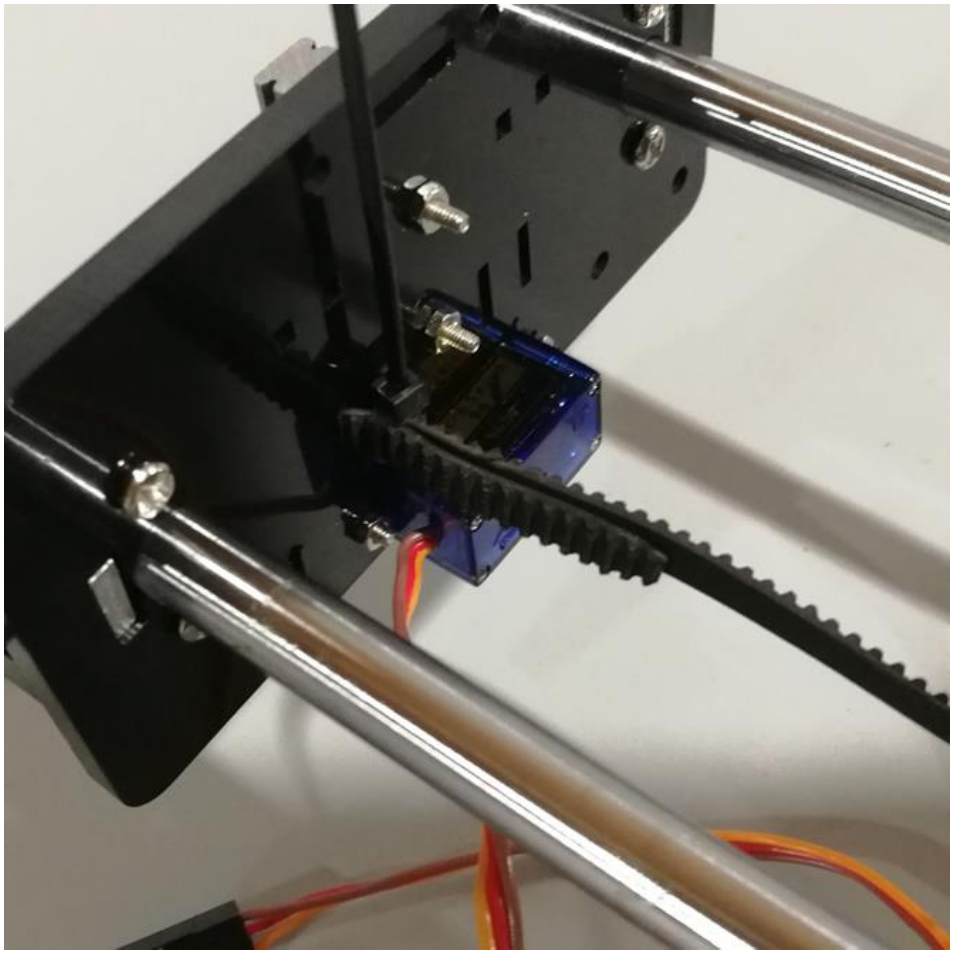


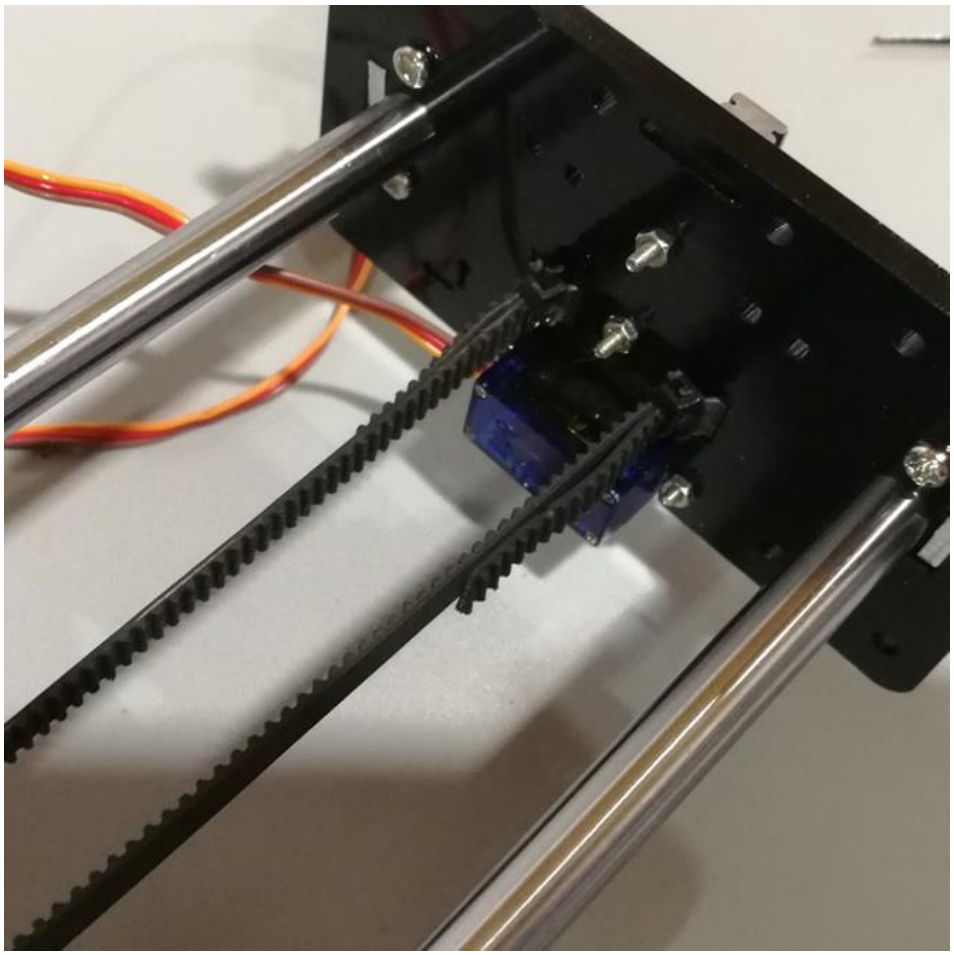




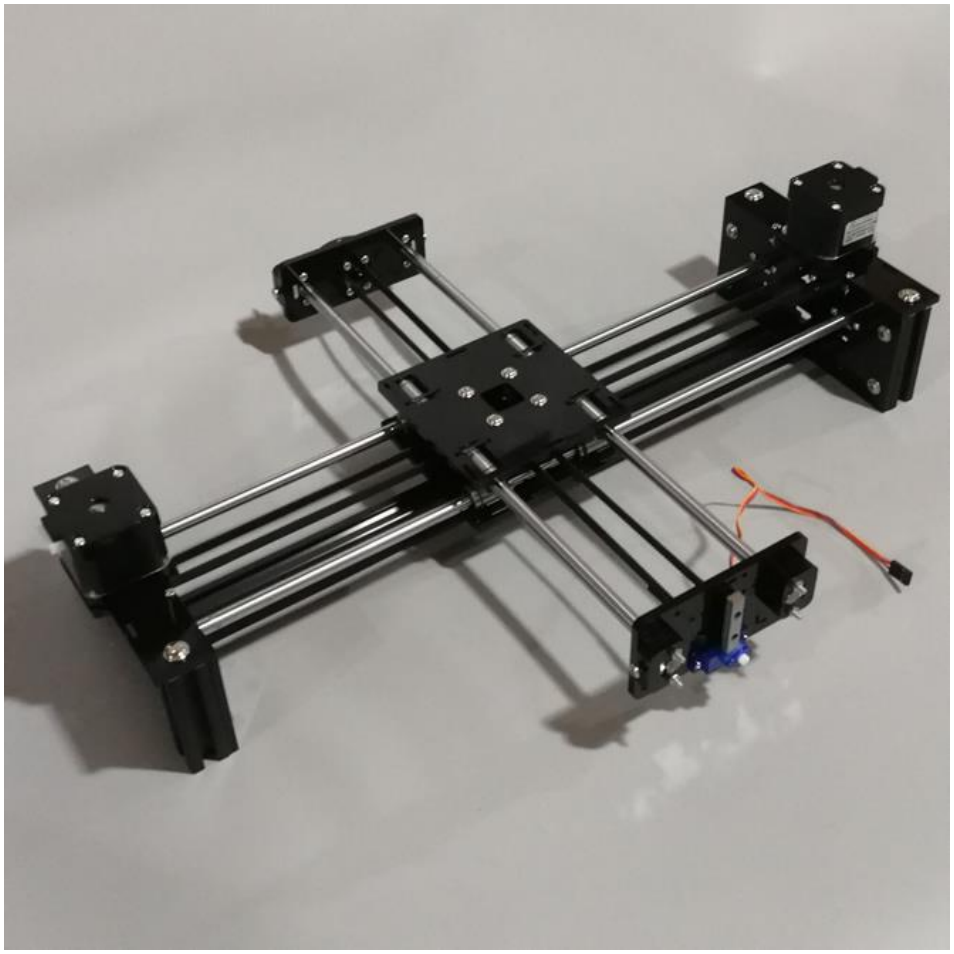






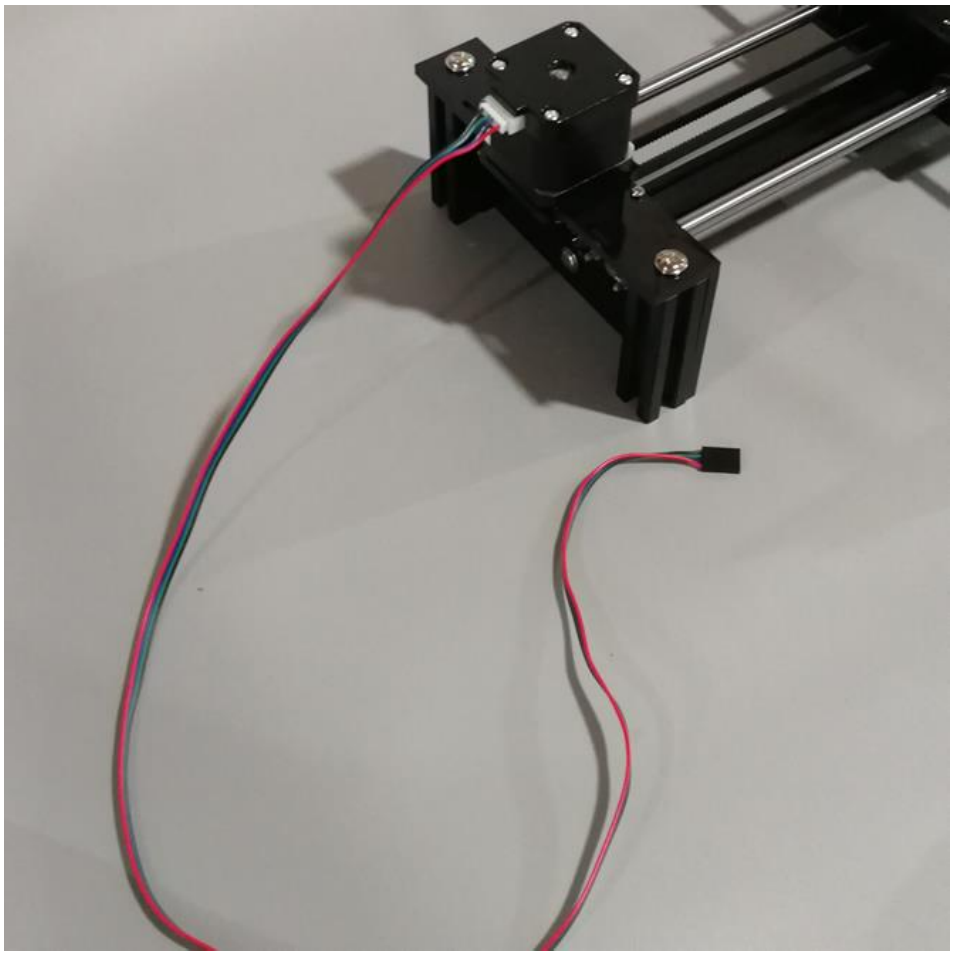


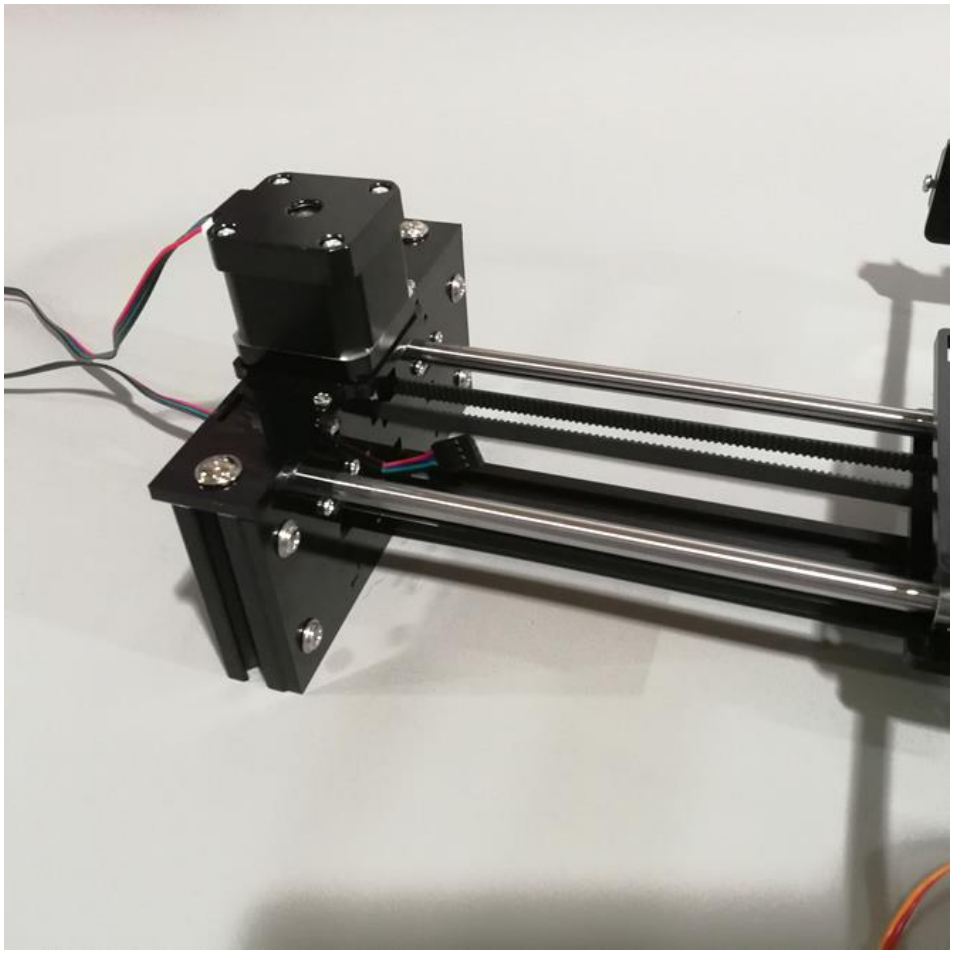

空框
松开同步轮紧定螺丝，调整同
步轮到空框中间位置再固定

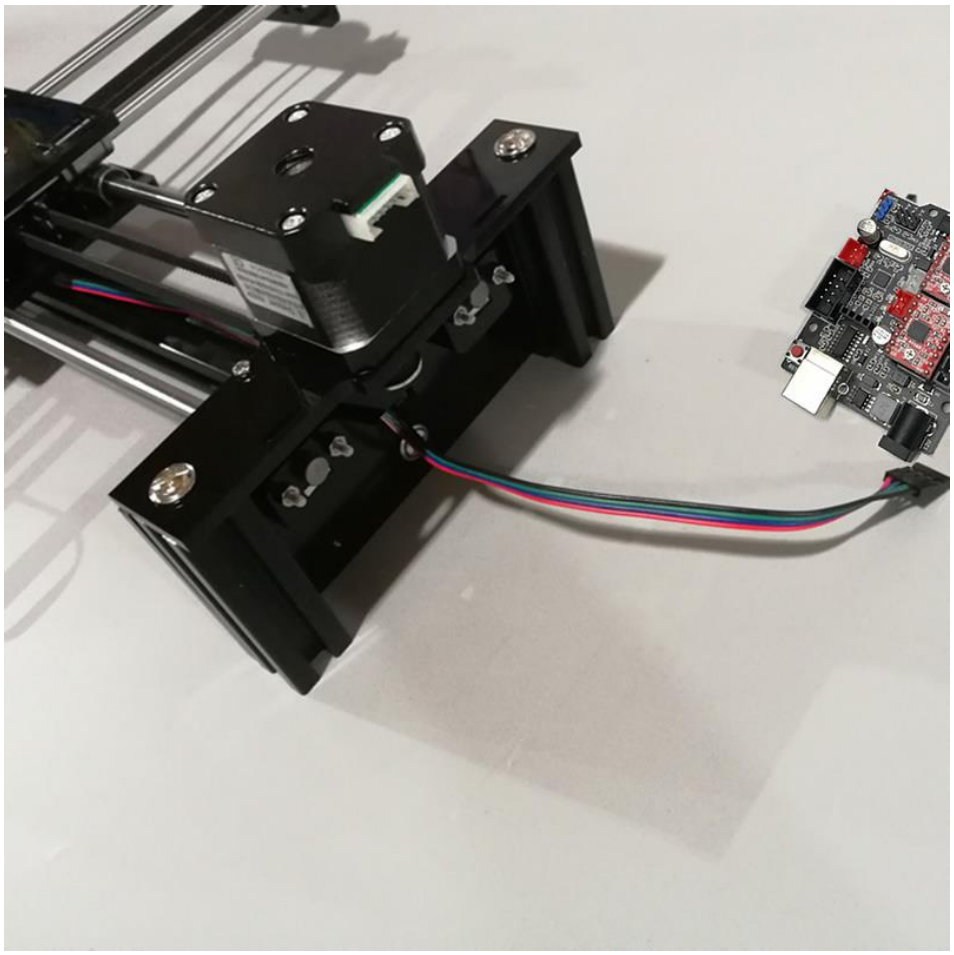


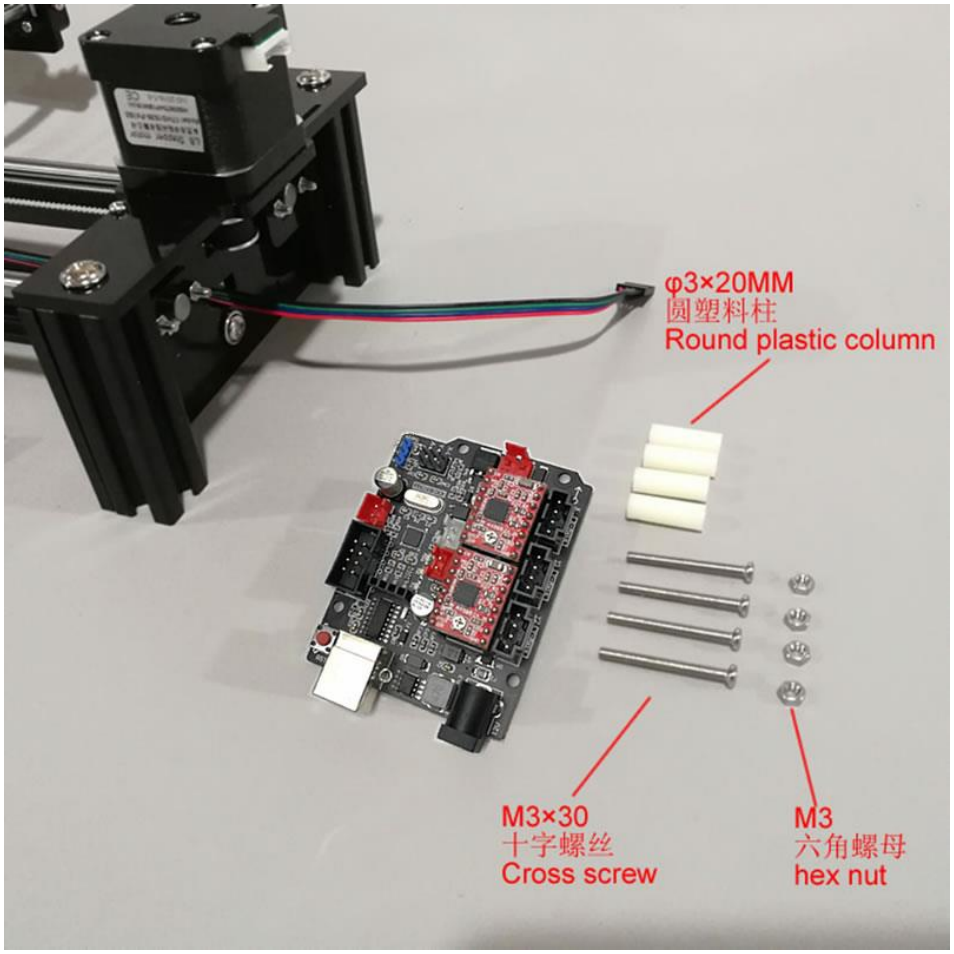
(7) Circuit wiring

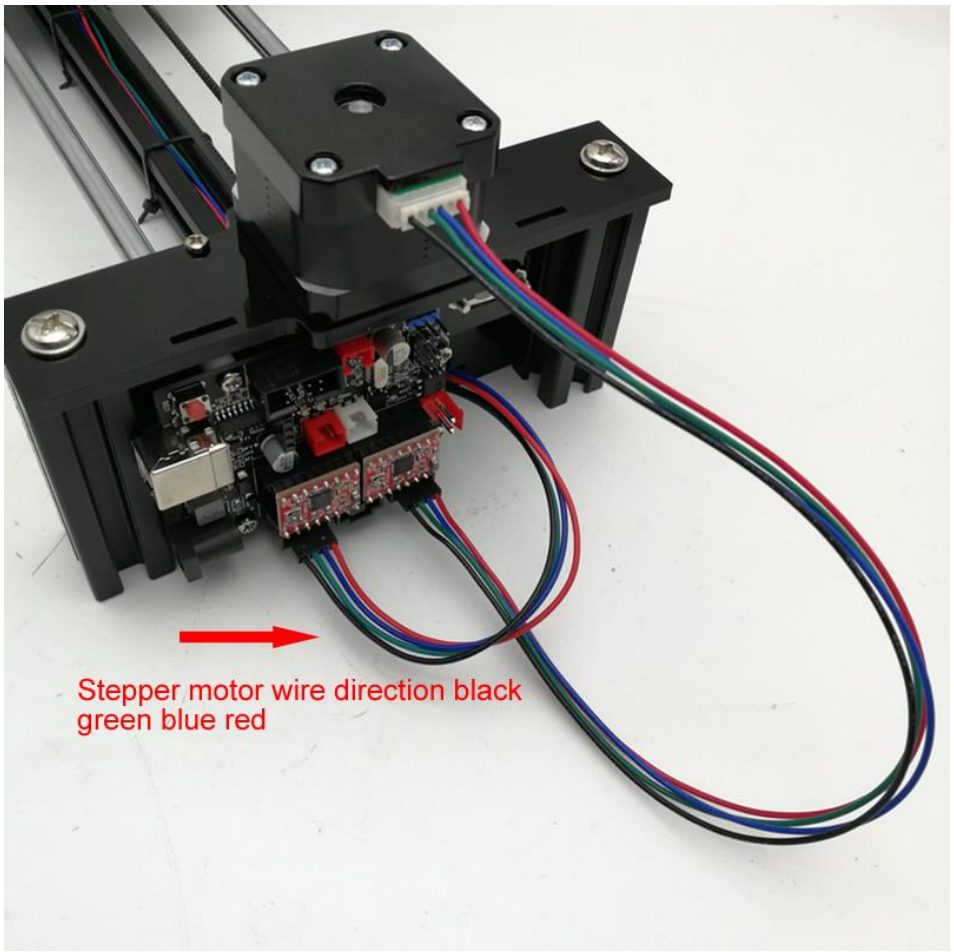
First, plug 2 stepper motor wires. The long one goes through the hole of the acrylic plate, crosses the line from the side of the aluminum profile, and then connects the three lines of the steering gear to the corresponding interfaces. Please refer to the characters with labels on the line. The corresponding characters of the professional controller are+, - and S. Then plug in the XY stepping motor plug wires respectively. The short one is X, and the long one is Y. Make sure that the color directions of the X and Y plug wires are the same. The default arrangement is red, blue, green and black from left to right. If the XY direction of the running test is opposite, the XY axis stepping motor plug wires can be inserted in a different direction, that is, the two lines are arranged in black, green, blue and red. If you need to define your own direction, change it yourself.

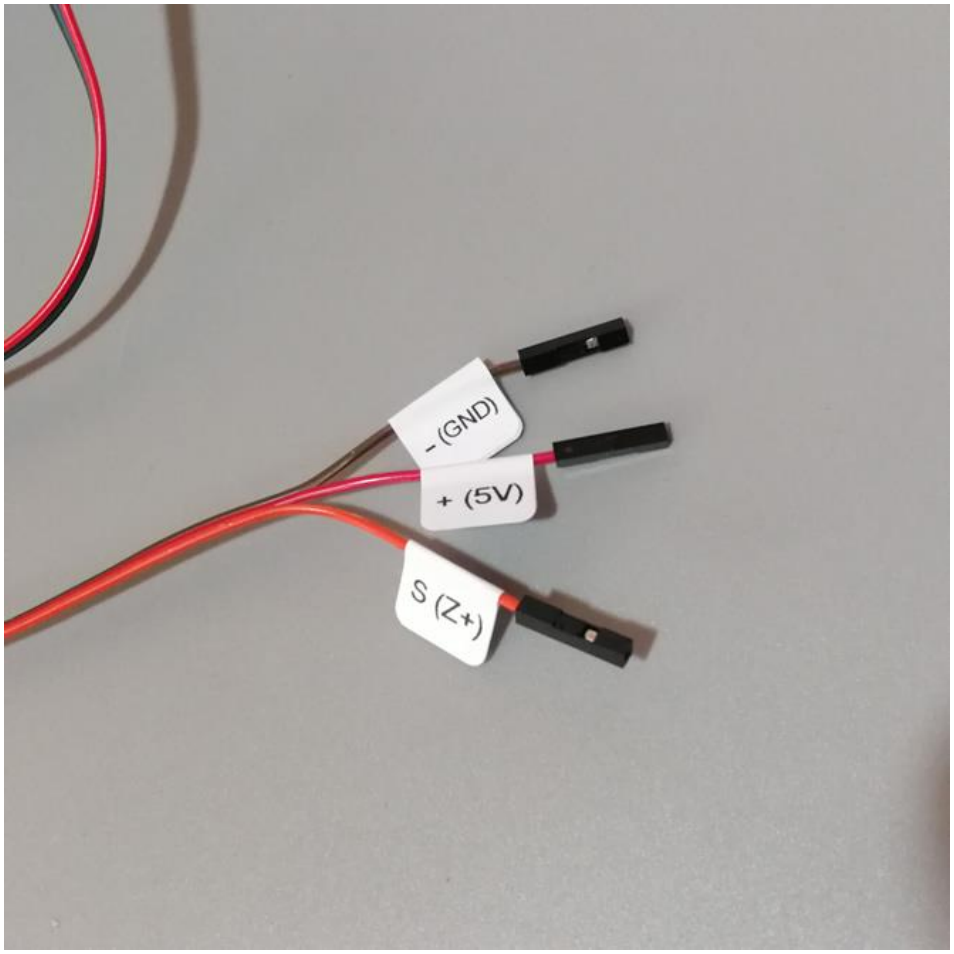


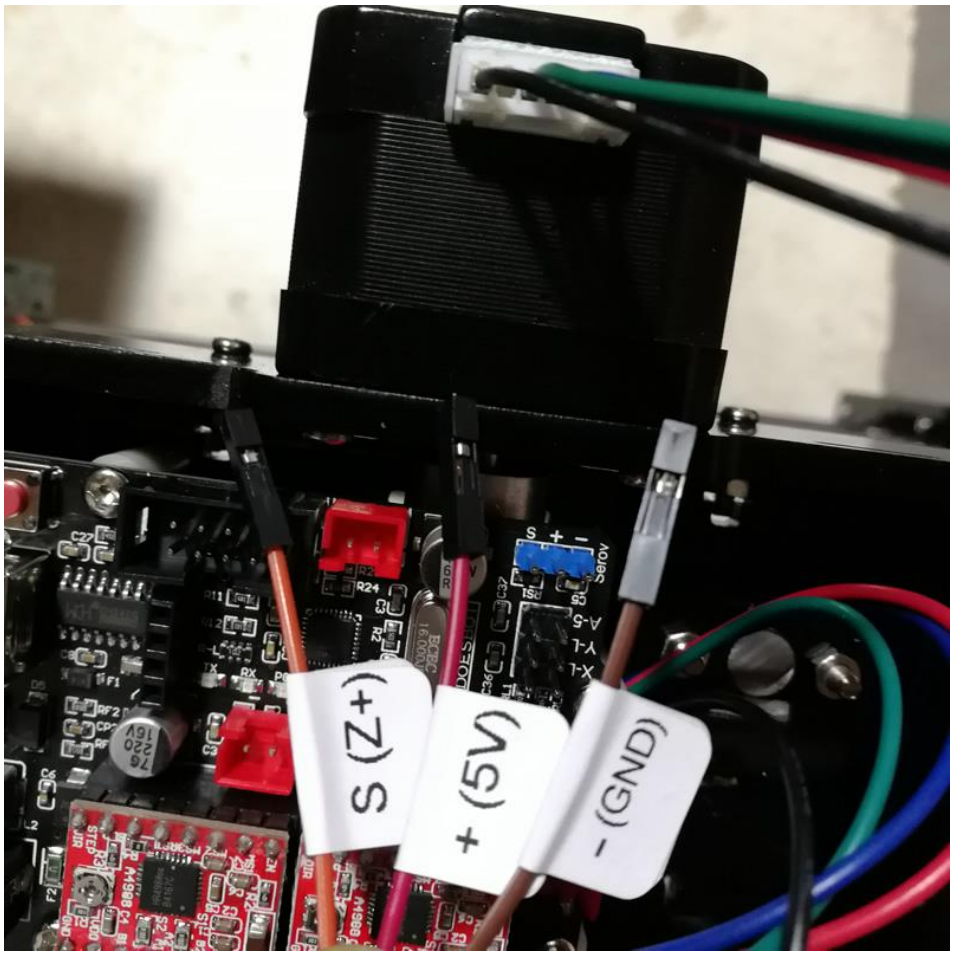


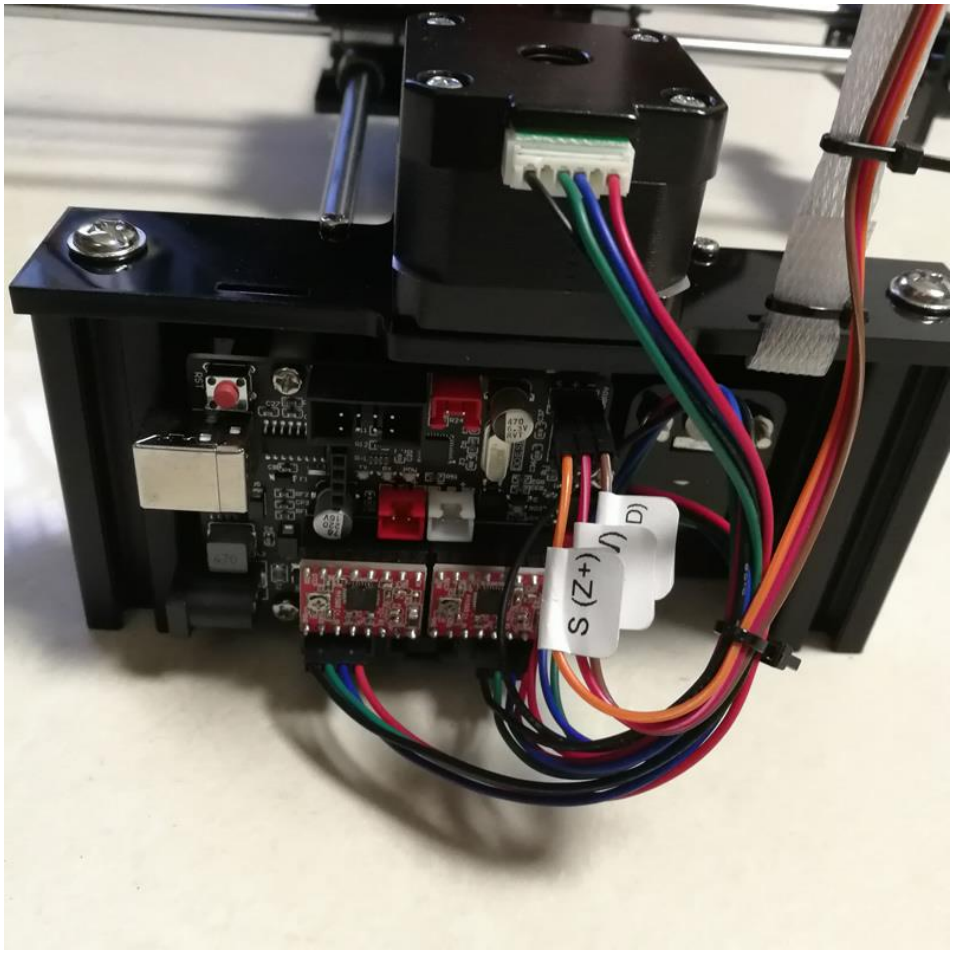



φ3×20MM
圆塑料柱
Round plastic column
M3×30
十字螺丝
Cross screw
M3
六角螺母
hex nut

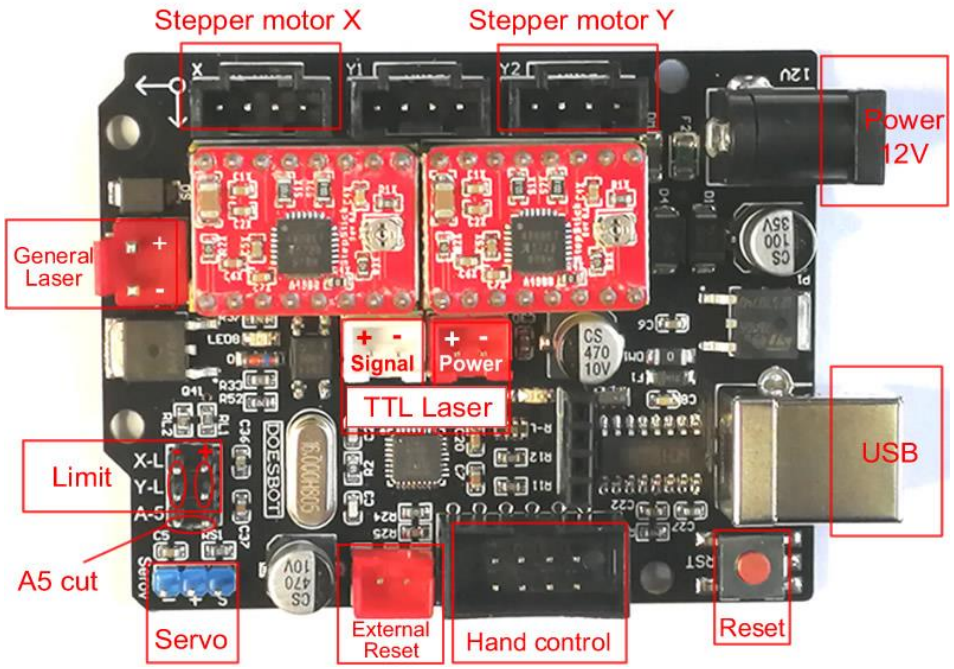

Stepper motor wire direction black
green blue red


- (GND)
+ (5V)
S (Z+)

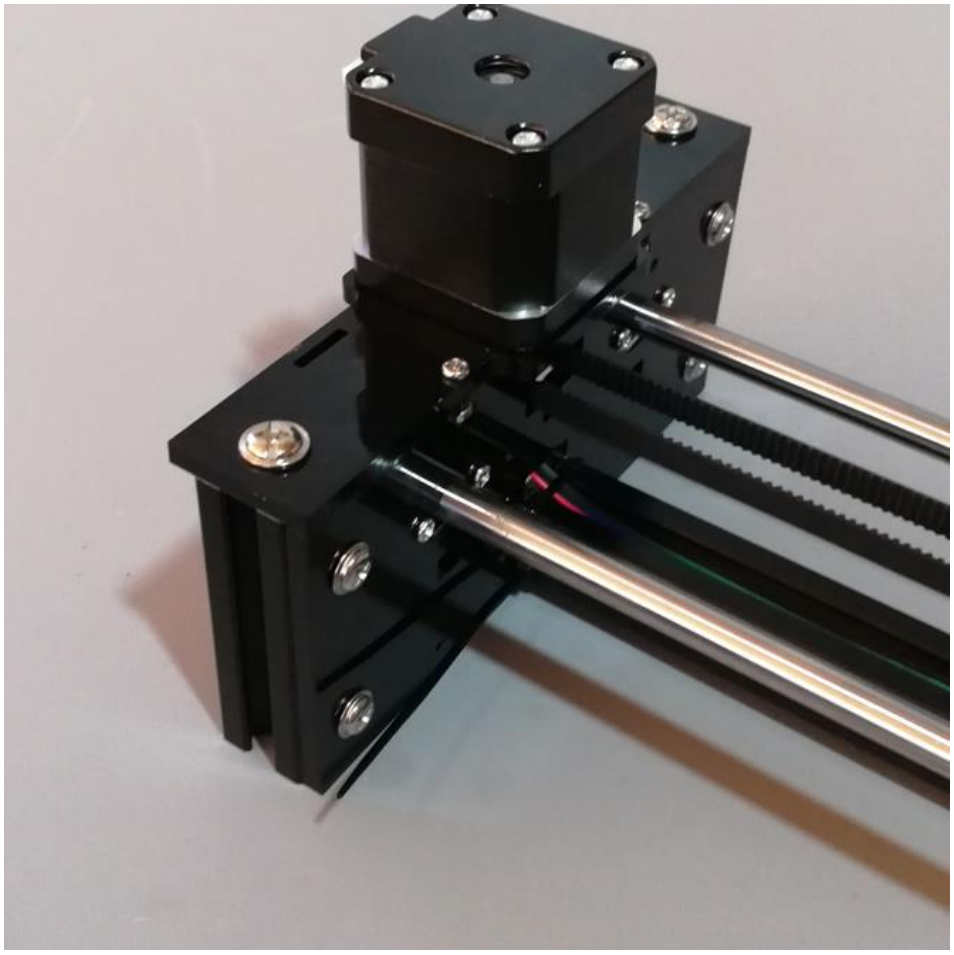

S (Z+)
+ (5V)
- (GND)

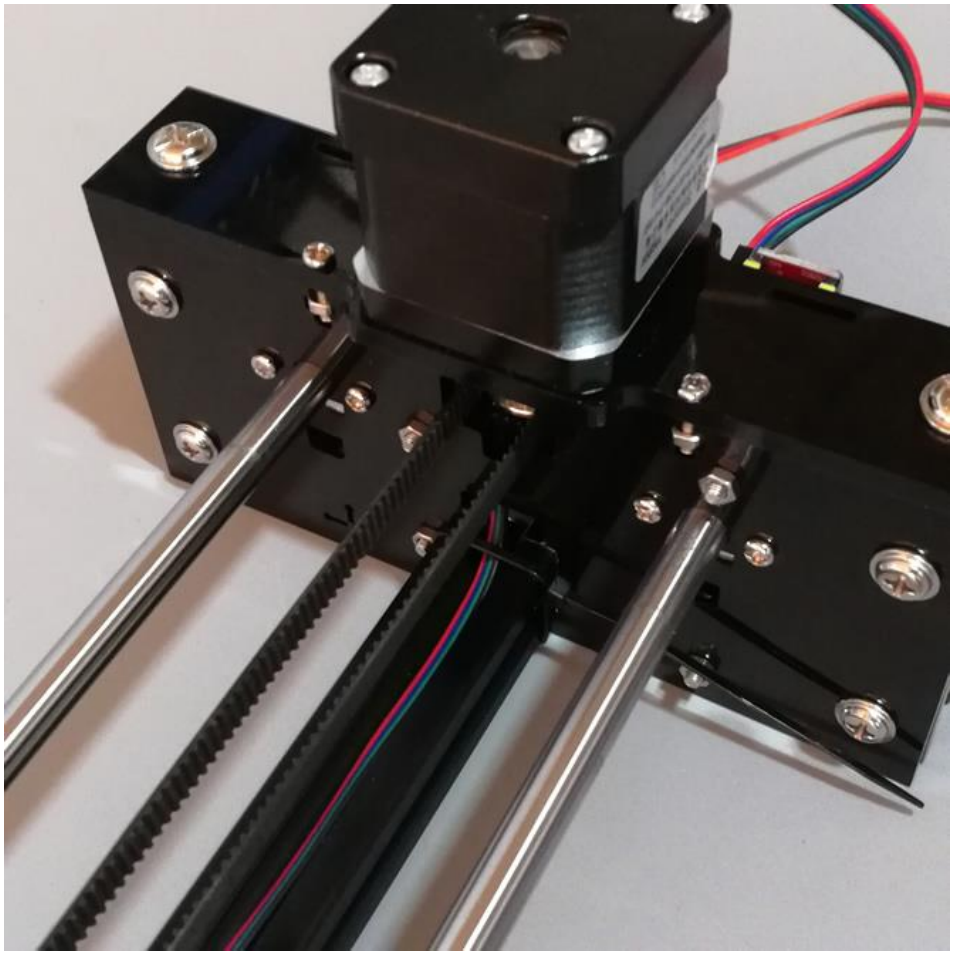


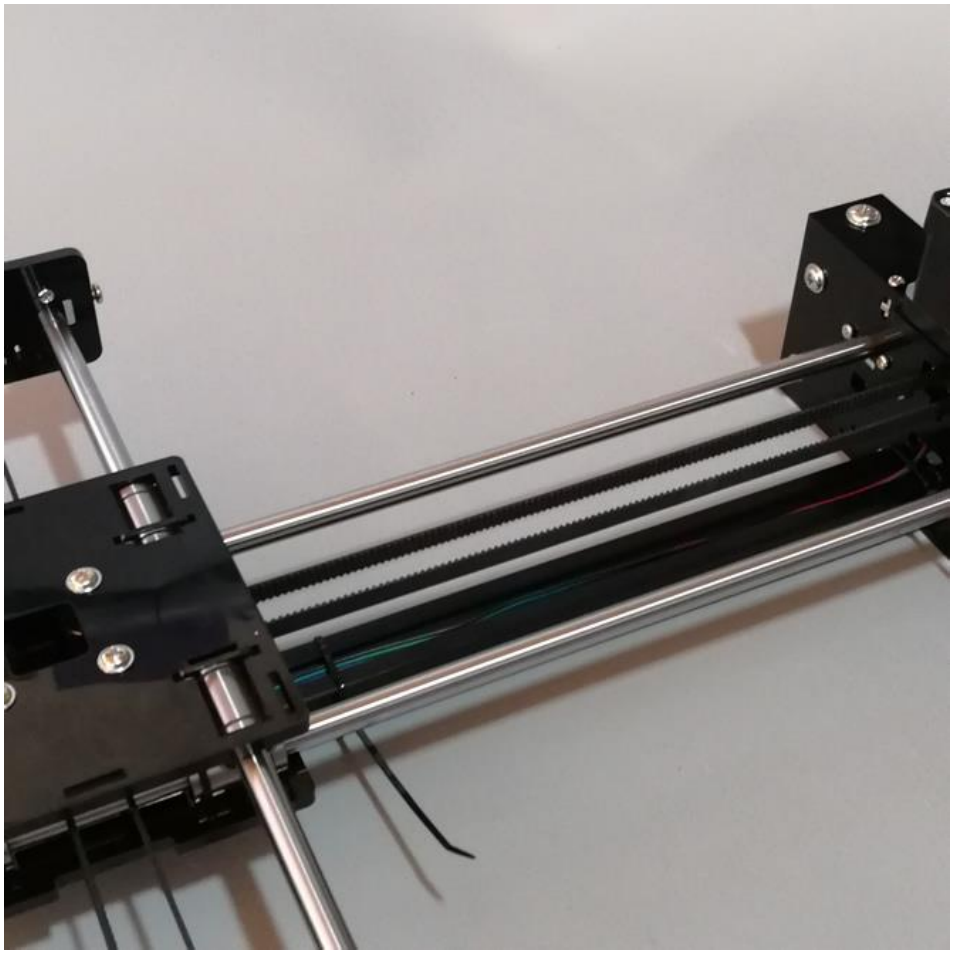
The wiring of the integrated control board is as follows:

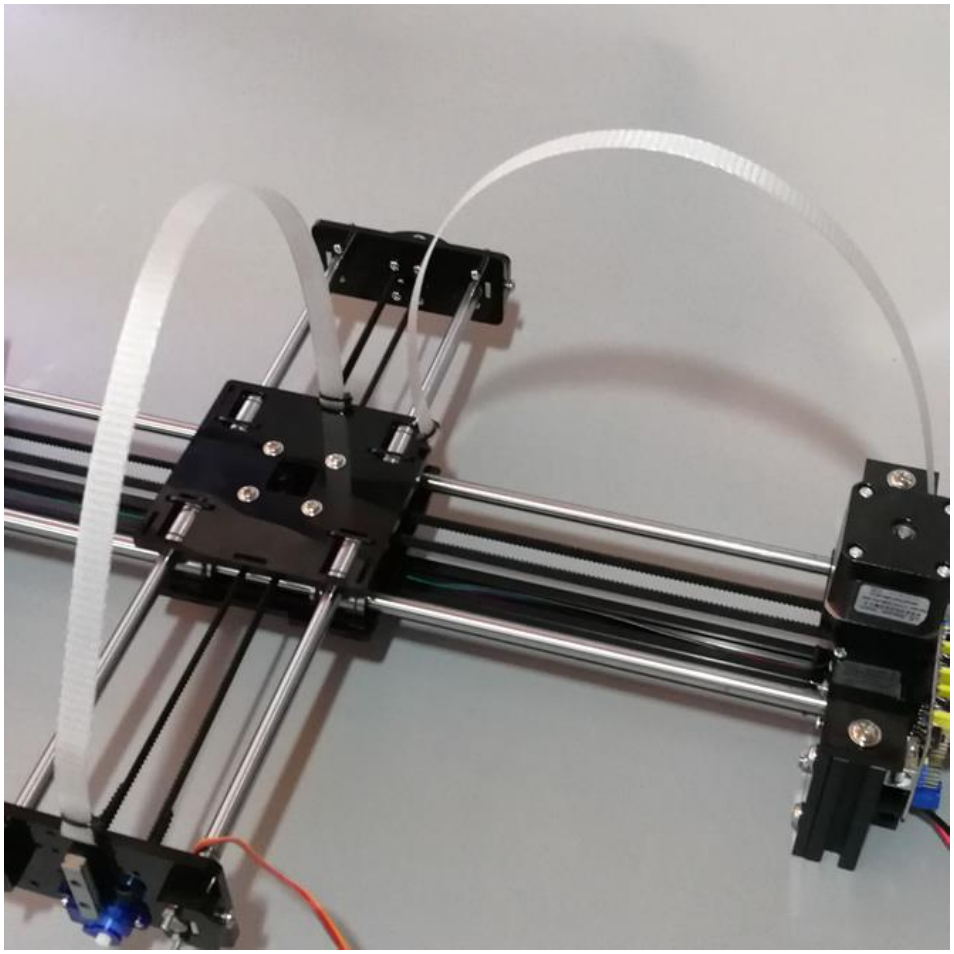


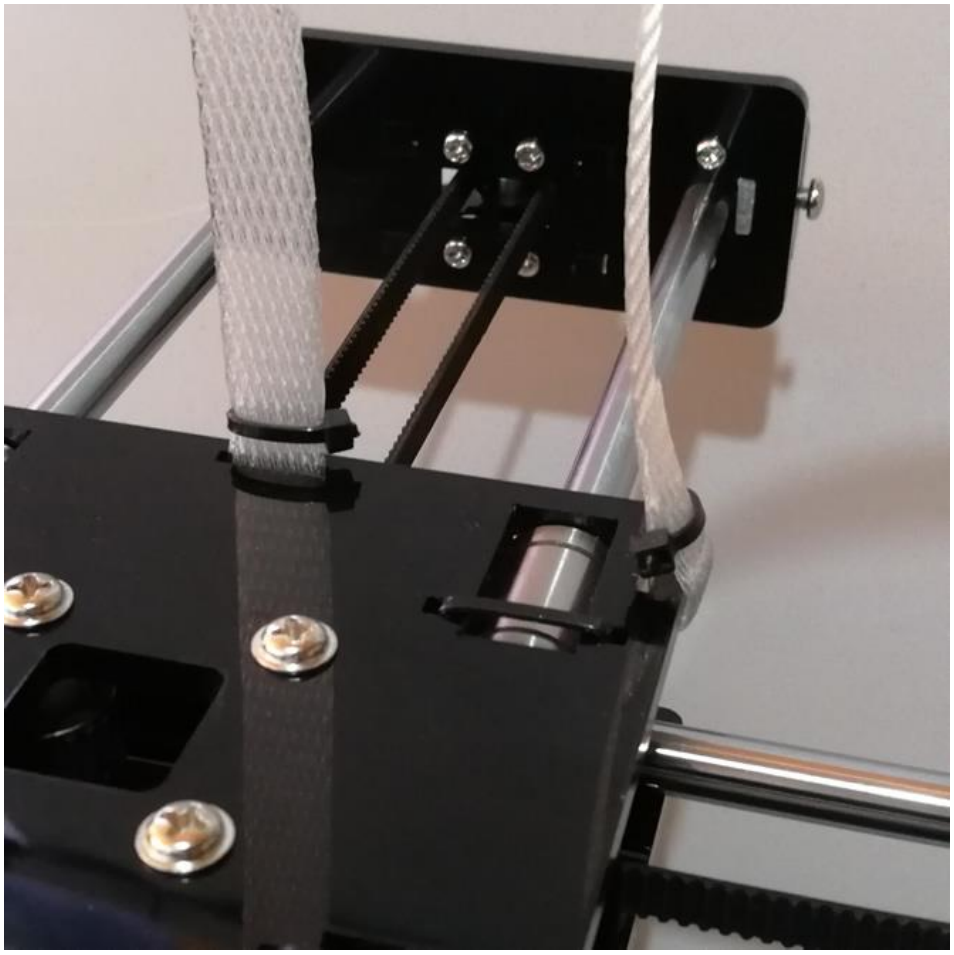
(8) Install the towline and cable tie

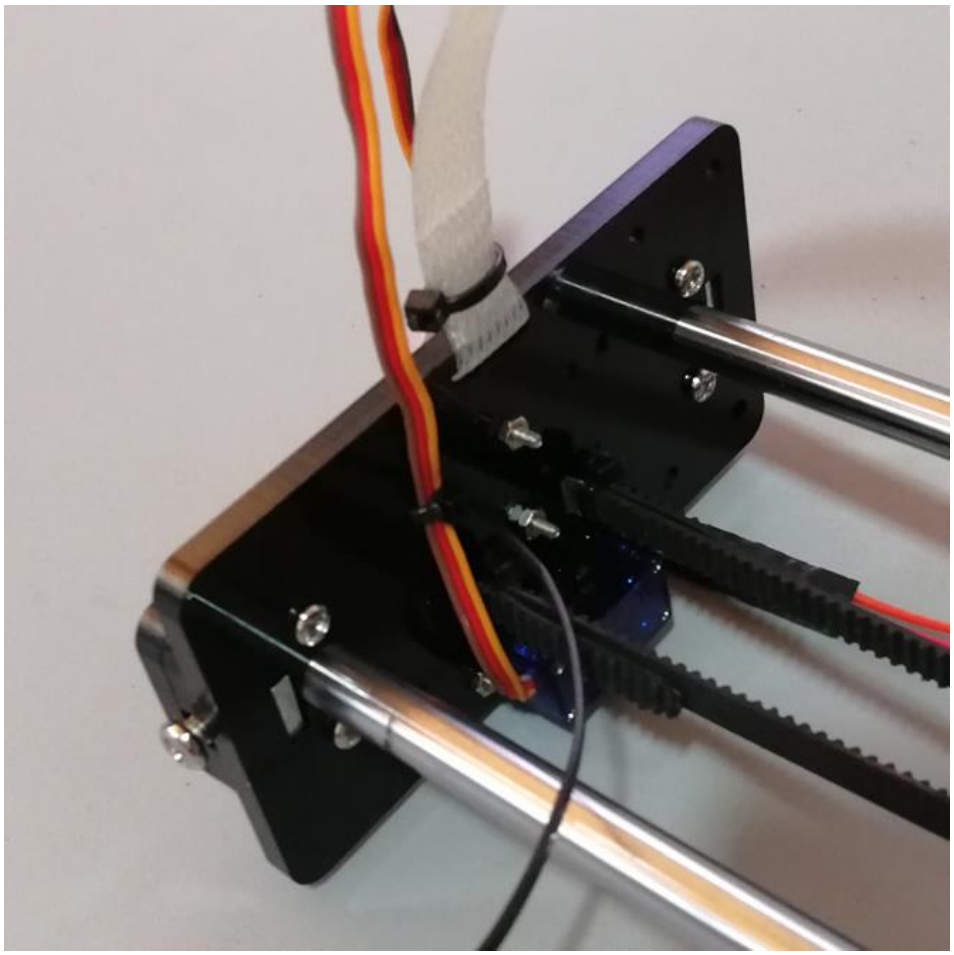






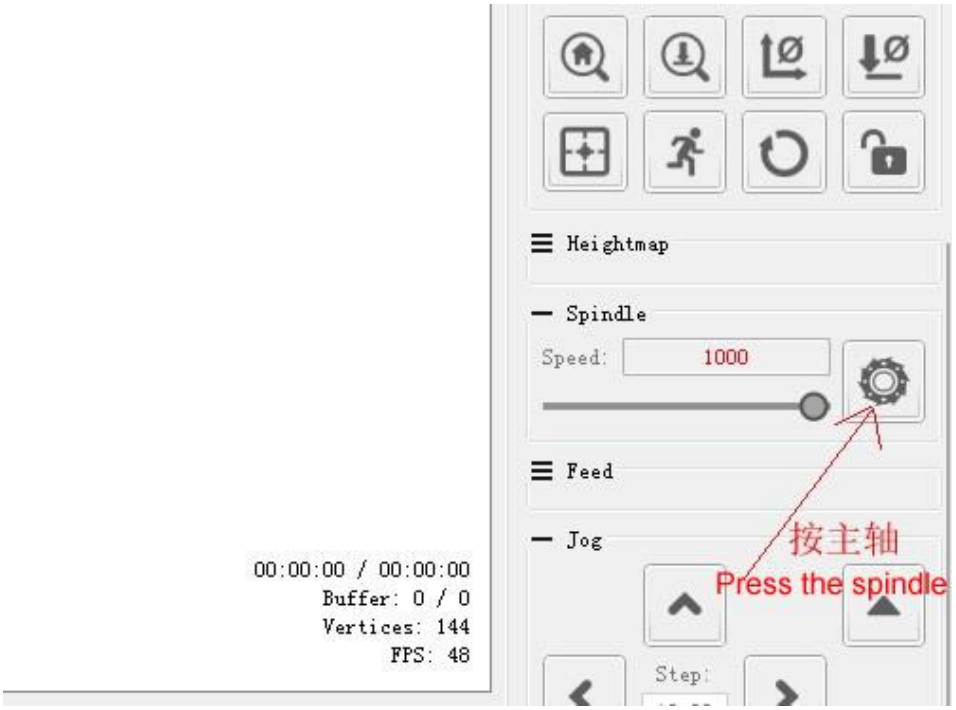


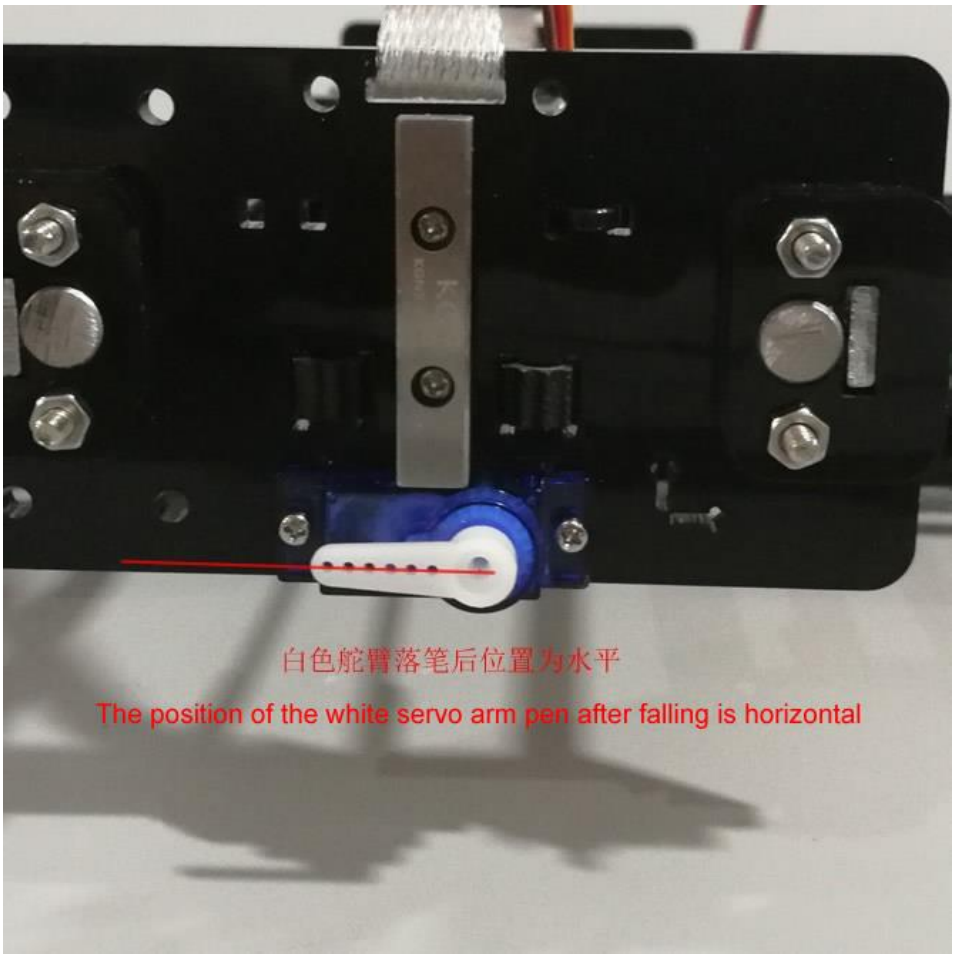


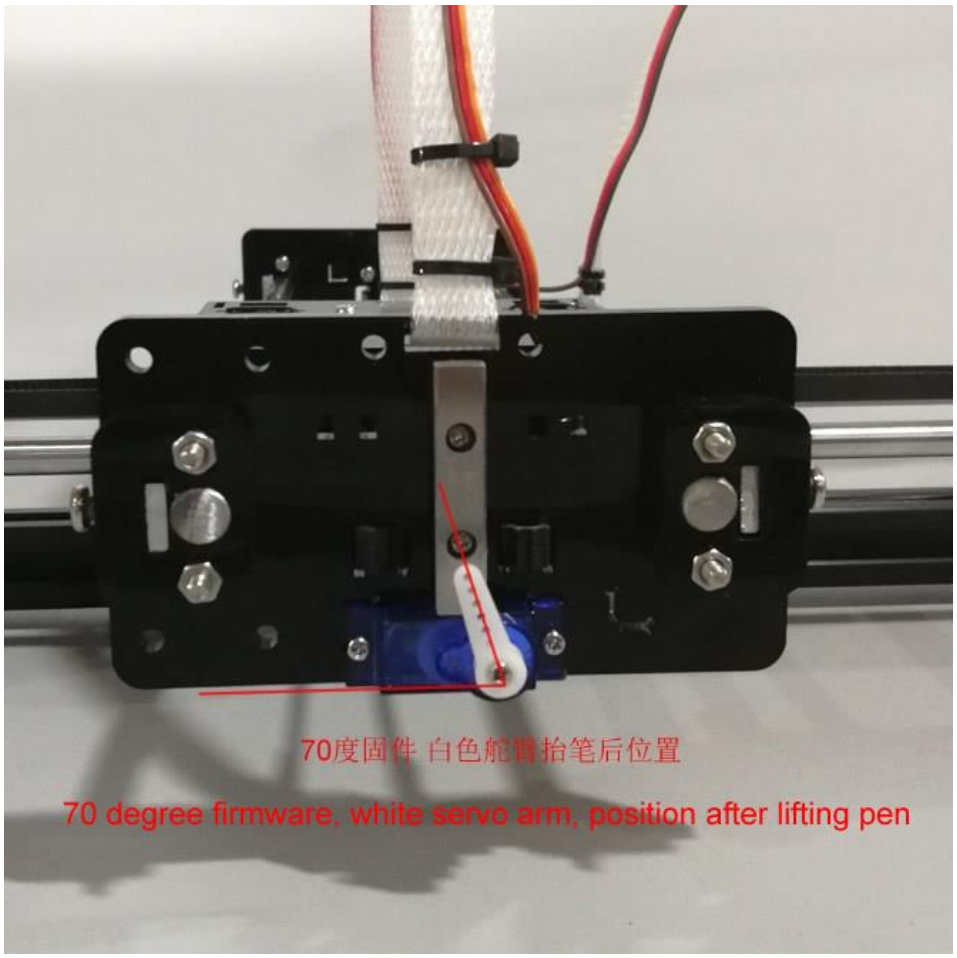


(9) steering gear debugging

Insert the USB cable, install GRBL software candle 0.9, open the software, first install the white rocker arm on the steering gear, gently press it in, do not screw, then press the software spindle switch several times, rocker arm will swing up and down, then let the rocker arm in the lower position, then pull out the rocker arm, re-level, then press the spindle a few times. Switch to ensure that the position is correct, tighten the M2 * 4 tapping screw (the shortest one in the package).

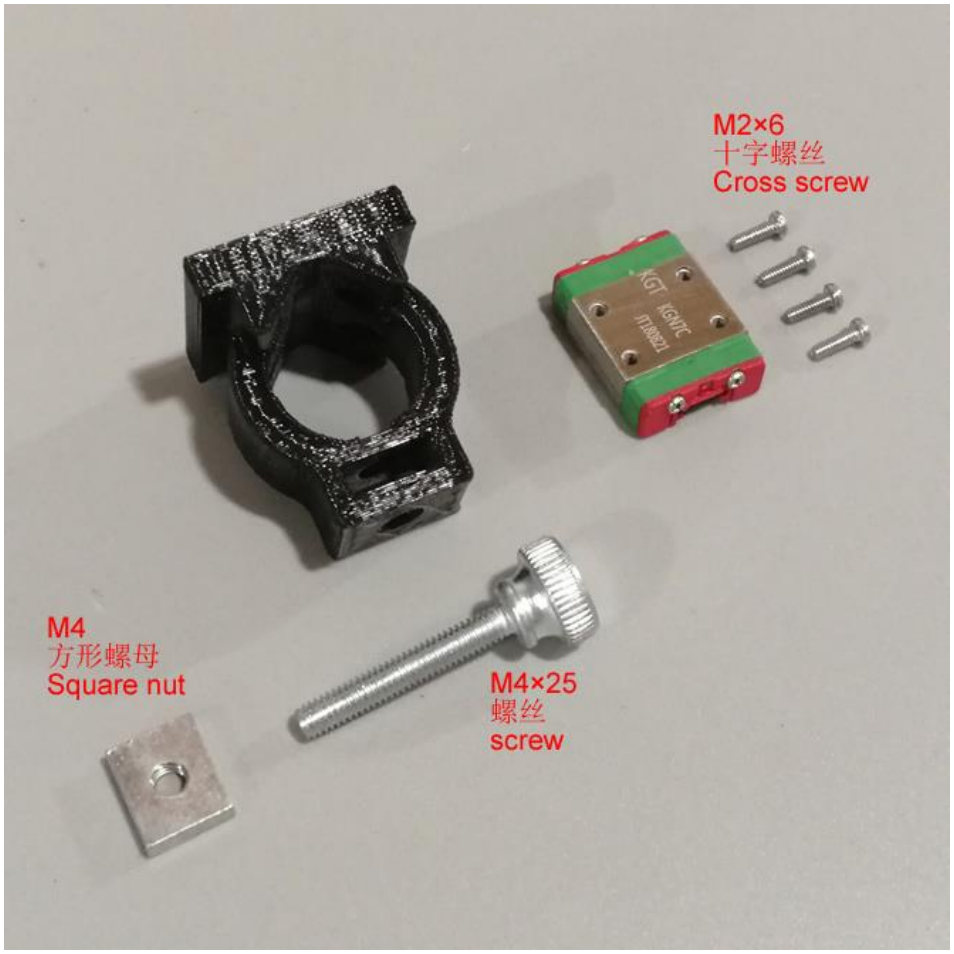


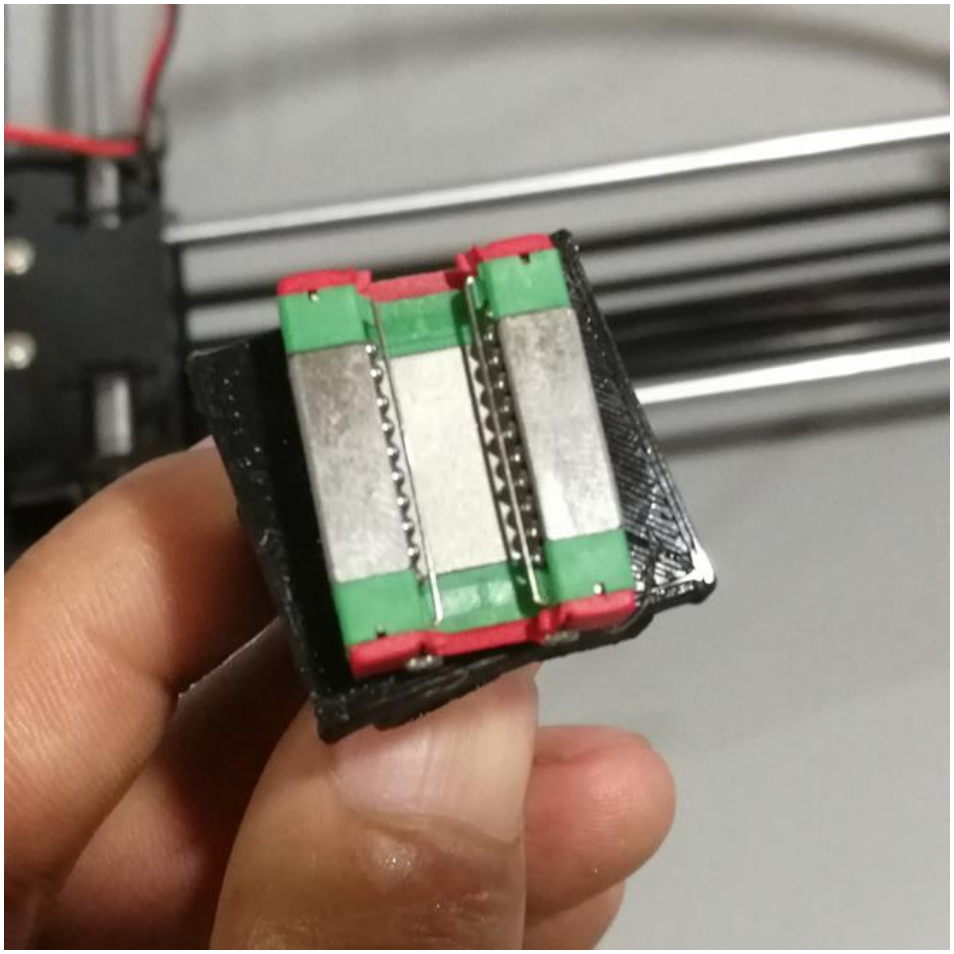


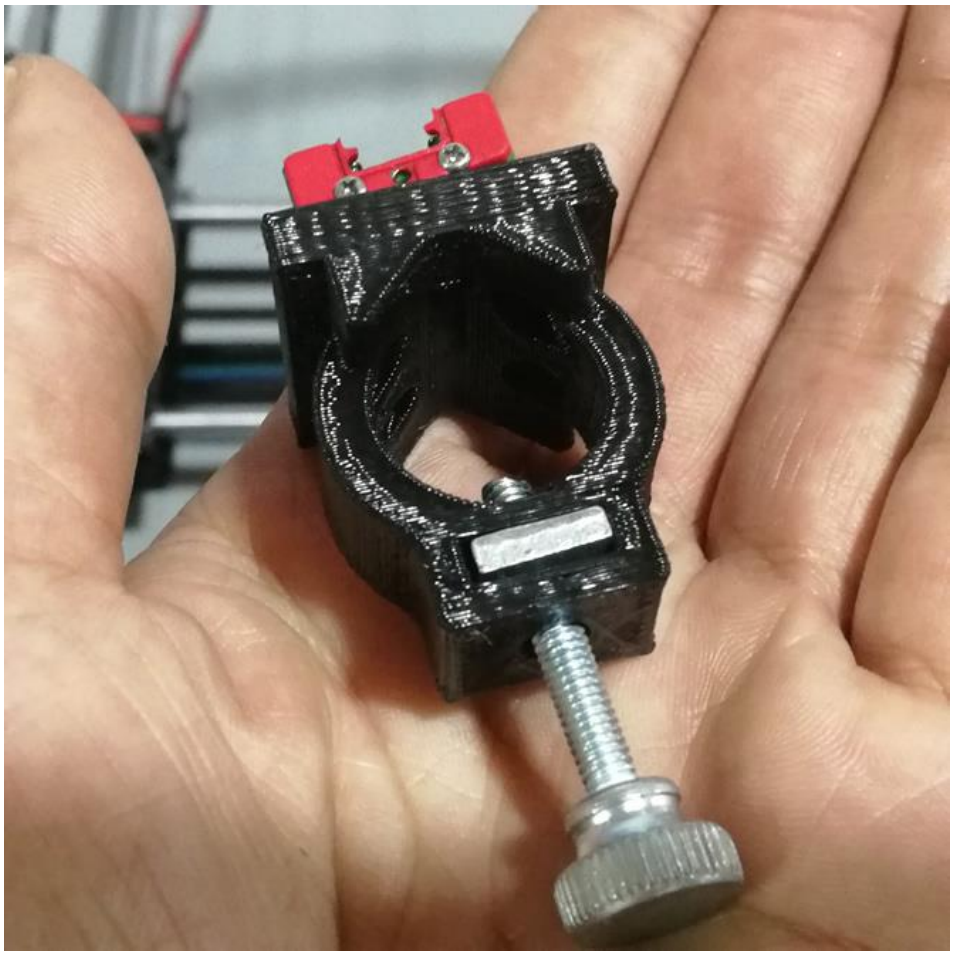


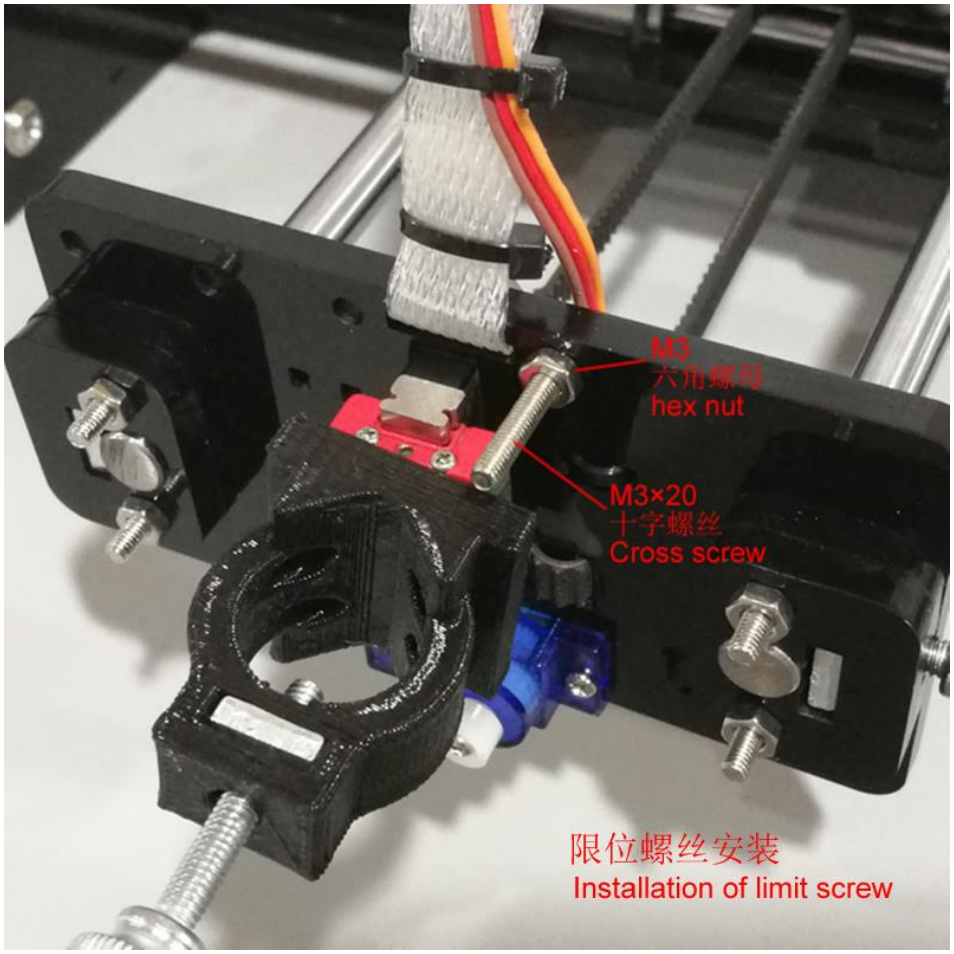
(10) Assembly penholder

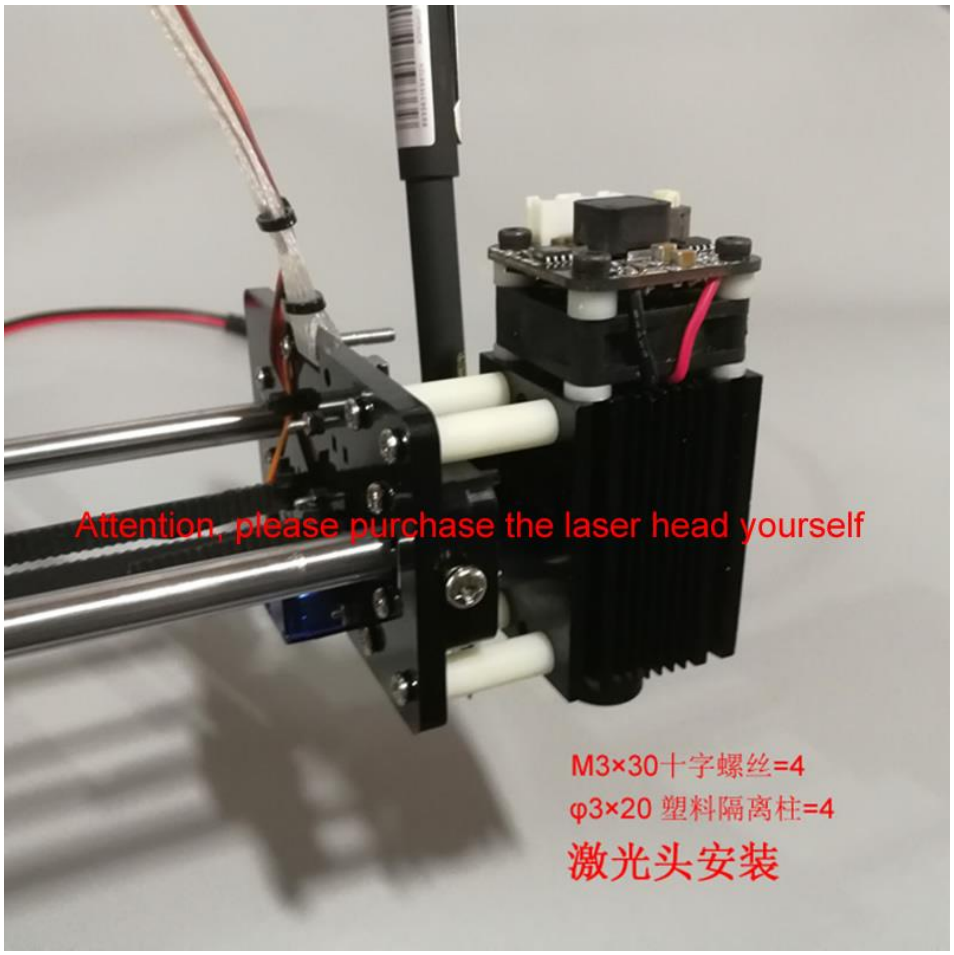
The 3D printing pen holder and slider can be assembled straight or tilted. After being installed, they can be lightly placed on the guide rail, and then M3*20 anti-screw and nut can be installed.

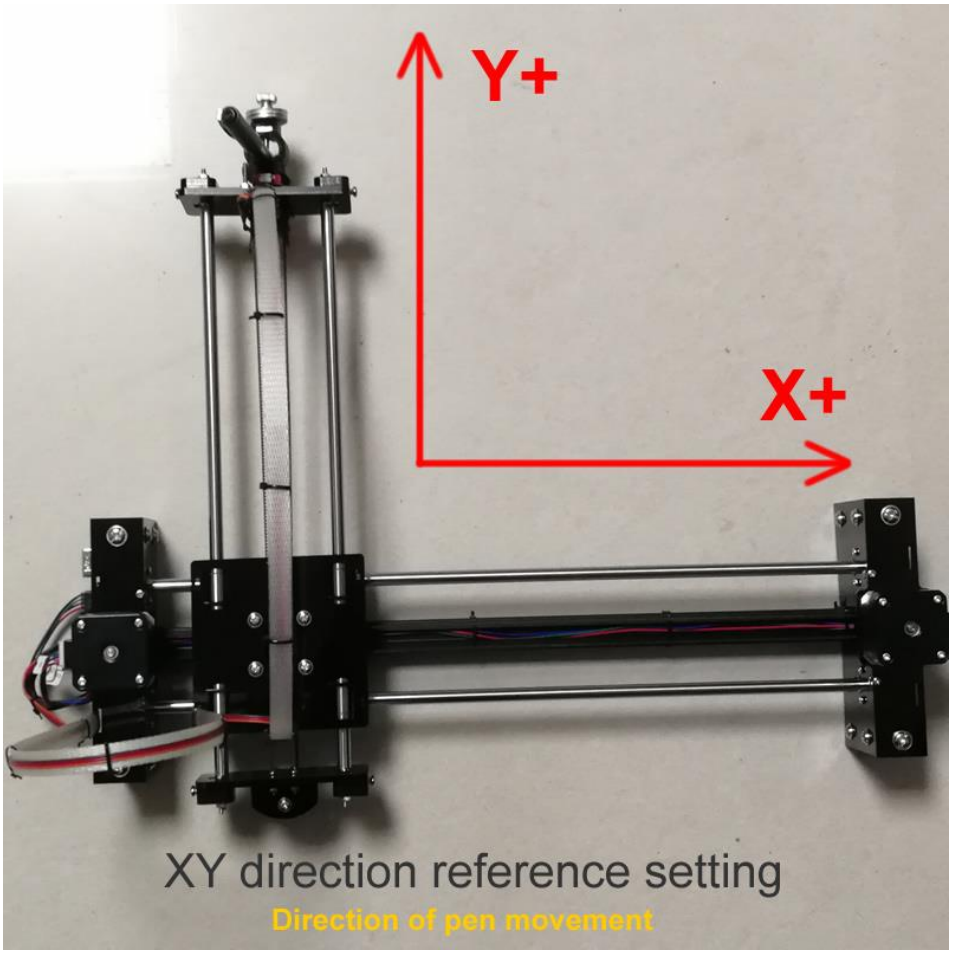







M3
六角螺母
hex nut
M3×20
十字螺丝
Cross screw
限位螺丝安装
Installation of limit screw


Attention, please purchase the laser head yourself
M3×30十字螺丝=4
φ3×20 塑料隔离柱=4
激光头安装



At this point, the assembly of our writing machine is declared complete. With a pen inserted, you can open your writing machine. Refer to our AX4 Writer Software Use Tutorial for related software tutorials.

Tip for installing a pen: First, lower the pen holder to the lowest position, then loosen the pen holder screw, place the pen, and slowly tighten the screw until there is a little gap between the pen and the pen holder (the pen can move up and down on the pen holder). Then, let the pen tip come into contact with the paper, and move the pen holder up about 2mm along the guide rail. Then, tighten the screw by hand to integrate the pen and the pen holder. The purpose of the above is to ensure that there is still a gap between the servo arm and the bottom of the pen holder when the pen tip is at the lowest position on the paper surface.

Requirements for pens: We recommend that pens used in writing machines weigh over 20g. Unlike handwriting, pens rely on gravity to complete writing. If the gravity is insufficient, it can cause defects such as missing strokes. If the pen does not fall smoothly, users can add heavy objects or rubber bands to the pen holder to improve force.

Paper placement technique: We require a flat tabletop for paper placement. It is recommended to place about 5 more sheets of paper under the writing paper. Secure the paper with a press block to ensure that it does not move while writing.

Recent update Thursday, May 18, 2023
E-mail: admin@doesbot.com