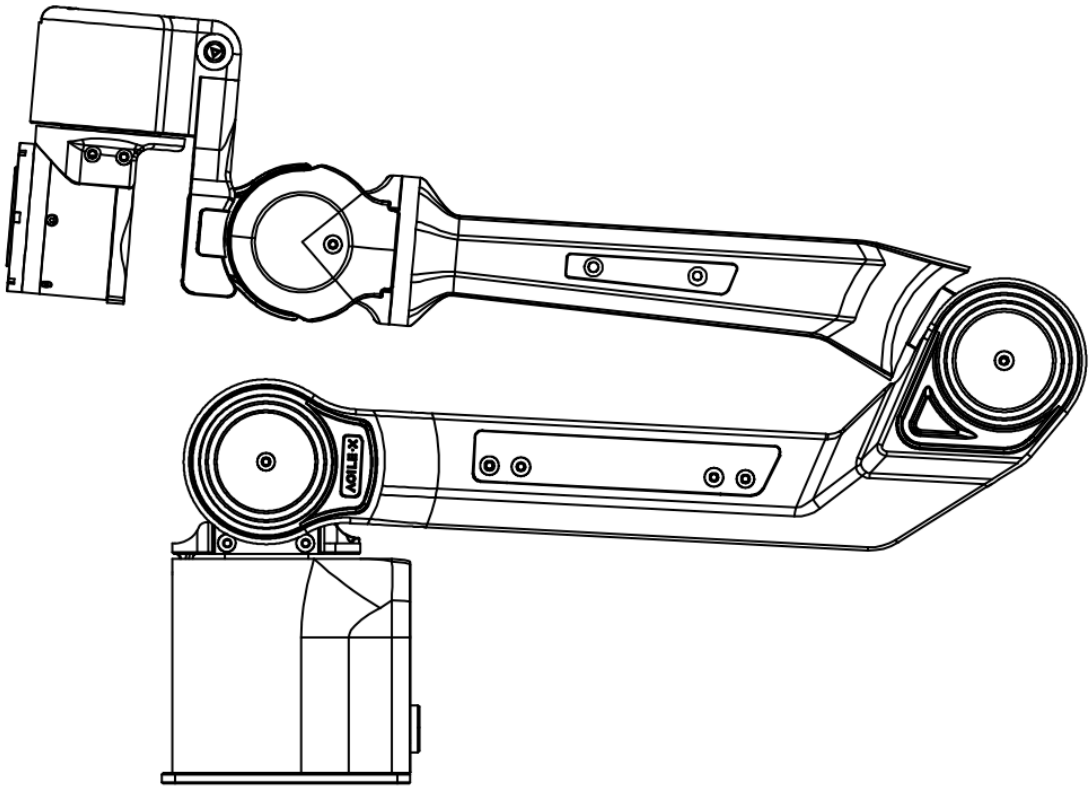
PIPER X USER MANUAL



Version Update Log

No.	Version	Date	Modified By	Reviewer	Re
1	V.1.0.0	2026/1/5	Dennis		Ini do cre
2	V.1.1.0	2026/1/25	Dennis		Dc fin
3	V.1.2.0	2026/3/9	Felix		Dc tra

Important Safety Information

4622字

This chapter contains important safety information. All individuals and organizations must read and understand this information before using the equipment, especially before the first power-on. It is essential to follow and execute all assembly instructions and guidelines in this manual. Pay special attention to text marked with warning symbols. Before using the equipment, please obtain and read the *PiPER-X User Manual*. For any questions regarding use, please contact support@agilex.ai.

Warning Symbol: ⚠ This indicates situations that may cause danger. If not avoided, they may result in personal injury, property damage, or serious equipment damage.

Warning ⚠: AgileX Robotics shall not be held liable if the robotic arm is damaged, altered, or modified in any way. AgileX Robotics shall not be liable for any damage to the robotic arm or any other equipment caused by program errors or operational failures.

Limitation of Liability: By using this robotic arm, you are deemed to have read, understood, acknowledged, and accepted all terms and content of the User Manual and Safety Information. The user agrees to be responsible for their own actions and all consequences arising therefrom. The user agrees to use the robotic arm only for legitimate purposes and agrees to these terms and any policies or guidelines that AgileX Robotics may establish. When using the robotic arm, strictly follow and execute the requirements including but not limited to the User Manual and Safety Information. AgileX Robotics shall not be liable for personal injury, accidents, property damage, legal disputes, or conflicts of interest caused by violations of the stated usage requirements or force majeure. The robotic arm is not suitable for persons under 18 years of age or those without full legal capacity. Please prevent such persons from coming into contact with this product and exercise extra caution when operating in their presence.

The information in this manual does not cover the design, installation, and operation of a complete robotic arm application system, nor does it cover all peripheral equipment that may affect the safety of such a system. The design and use of the complete system must comply with the safety requirements established in the standards and regulations of the country where the robotic arm is installed.

Integrators and end customers of the robotic arm are responsible for ensuring compliance with relevant regulations and applicable laws, and for ensuring that there are no significant hazards in the complete robotic arm application. This includes but is not limited to:

1. Validity

- Conduct a risk assessment of the complete robotic arm system.

- Connect additional safety equipment for other machinery as defined by the risk assessment.
- Verify that the design and installation of the entire robotic arm system, including software and hardware, are correct.
- The relevant functions of this robotic arm require integrators and end customers to conduct safety assessments in accordance with relevant regulations and applicable laws to ensure that the developed robotic arm has no significant hazards or safety risks in actual applications.
- Be aware of potential safety risks before operating and using the equipment.
- Ensure that users do not modify any safety measures.
- Collect all documents in the technical file, including the risk assessment and this manual.

2. Environment

- Before first use, carefully read this manual to understand basic operations and operating procedures.
- Use in a relatively open area. The robotic arm itself does not have any automatic obstacle avoidance or sensing sensors.
- Operate in ambient temperatures of –20°C to 50°C.
- If the robotic arm is not custom–ordered with a specific IP rating, its water and dust resistance is IP22.

3. Inspection

- Ensure the robotic arm shows no obvious abnormalities.
- Ensure cable connections are normal during use.

4. Operation

- Ensure the surrounding area is relatively open during operation.
- Operate within line of sight.
- The maximum payload of the robotic arm is 1.5 kg. Ensure the effective payload does not exceed 1.5 kg during use.
- When the equipment shows abnormalities, stop use immediately to avoid secondary injury.
- When the equipment shows abnormalities, contact relevant technical personnel. Do not attempt to handle it yourself.

- Use the equipment in environments that meet the IP protection rating requirements according to the device's IP rating.

5. Usage Warnings ⚠:

- Ensure the robotic arm and tools/end effectors are always correctly and securely fixed in place.
- When it is necessary to enter the robotic arm workspace, protective goggles and protective equipment must be worn.
- Ensure the robotic arm has sufficient space to move freely.
- Do not wear loose clothing when operating the robotic arm. Ensure long hair is tied back when operating.
- Do not use the robotic arm if it is damaged or shows any abnormality.
- If the host computer software displays error messages, perform emergency stop immediately and contact relevant technical personnel.
- Keep the head, face, and other body parts outside the reach of the robotic arm being operated or about to be operated.
- Never modify the robotic arm. Modifications may cause unpredictable hazards for integrators.
- Do not expose the robotic arm to permanent magnetic fields. Strong magnetic fields can damage the robotic arm.
- The robotic arm generates heat during operation. Do not handle or touch the robotic arm while it is operating or immediately after stopping, as prolonged contact may cause discomfort. Disconnect power and wait one hour for the robotic arm to cool down.
- Connecting different machinery may increase hazards or create new hazards. Always conduct a comprehensive risk assessment of the entire installation. Different functional safety levels may apply based on the risk assessment; therefore, when different safety and emergency stop performance levels are required, always select the highest performance level. Always read and understand the manuals of all equipment used in the installation.
- The robotic arm is not suitable for persons under 18 years of age or those without full legal capacity.

---

1. Robotic Arm Introduction

This 6-DOF (degree of freedom) robotic arm is designed for education and research, consumer applications, and industrial automation. It has a payload capacity of 1.5 kg and is suitable for humanoid robots, automatic assembly, automatic handling, and various other research and industrial applications. Six rotary joints provide full-range operational flexibility with high precision and repeatability. The robotic arm features a modular design for easy maintenance and upgrades. It provides an intuitive user interface that simplifies programming and operation, allowing even non-professionals to get started quickly. It can be widely used in scientific research, education, automotive manufacturing, electronic assembly, food processing, laboratory automation, and medical device operation.

1.1 Product List

Item	Quantity
6-DOF Robotic Arm PIPER-X	1
Power Adapter (adapter + power cord)	1
Communication Module (USB to CAN module)	1
Aviation Connector	1
Base Mounting Screws	4
Base Installation Wrench	1

1.2 Performance Parameters

Parameter Type	Item	Specification

Structural Parameters	Degrees of Freedom	6
	Payload	1.5 kg
	Body Weight	4.5 kg
	Repeatability	±0.1 mm
	Working Radius	669.59 mm
	Standard Supply Voltage	DC 24V
	Power Consumption	Max ⩽120W, Averag
	Material	Aluminum alloy fram housing
	Controller	Integrated
	Communication	CAN
	Control Method	Drag teaching / Offl / API / Host comput
	External Interfaces	Power interface ×1, interface ×1
	Base Mounting Dimensions	70mm × 70mm, M5×
	Operating Environment	Temperature: –20 to Humidity: 25%–85% condensing
	Noise	<60 dB
	Installation	Desktop mounting
Motion Parameters	Joint Motion Range	J1:±154° J2:0°~195 J3:–175°~ J4:–90°~9 J5:–90°~9 J6:±165°

4622字

	Joint Max Speed	J1:180°/s J2:195°/s J3:180°/s J4:225°/s J5:225°/s J6:225°/s
Note: The above data are test results of AgileX robotic arms in controlled test environments. vary under different environments and usage conditions. Please refer to actual experience.		

Two-Finger Gripper Parameters (Optional)

Item	Specification
Body Weight	500 g
Precision	±0.5 mm
Opening Range	0–100 mm
Rated Gripping Force	40 N
Max Gripping Force	50 N
Supply Voltage	DC 24V
Power Consumption	Max ⩽50W, Average ⩽30W
Contact Surface Material	Rubber
Controller	Integrated
Communication	CAN
Control Method	Drag teaching / Offline trajectory / AP computer
External Interfaces	Power interface ×1, CAN interface ×1
Mounting Method	Flange mounting
Operating Environment	Temperature: –20 to 50°C, Humidity: 2 non–condensing
Noise	<60 dB

Teach Pendant Parameters (Optional)

Item	Specification
Body Weight	550 g
Precision	±0.5 mm
Opening Range	0–100 mm
Rated Gripping Force	40 N (force control, force feedback)
Max Gripping Force	50 N (force control, force feedback)
Supply Voltage	DC 24V
Power Consumption	Max ⩽50W, Average ⩽30W
Contact Surface Material	Rubber
Controller	Integrated
Communication	CAN
Control Method	Drag teaching / Offline trajectory / AP computer
External Interfaces	Power interface ×1, CAN interface ×1
Mounting Method	Flange mounting
Operating Environment	Temperature: –20 to 50°C, Humidity: 2 non–condensing
Noise	<60 dB

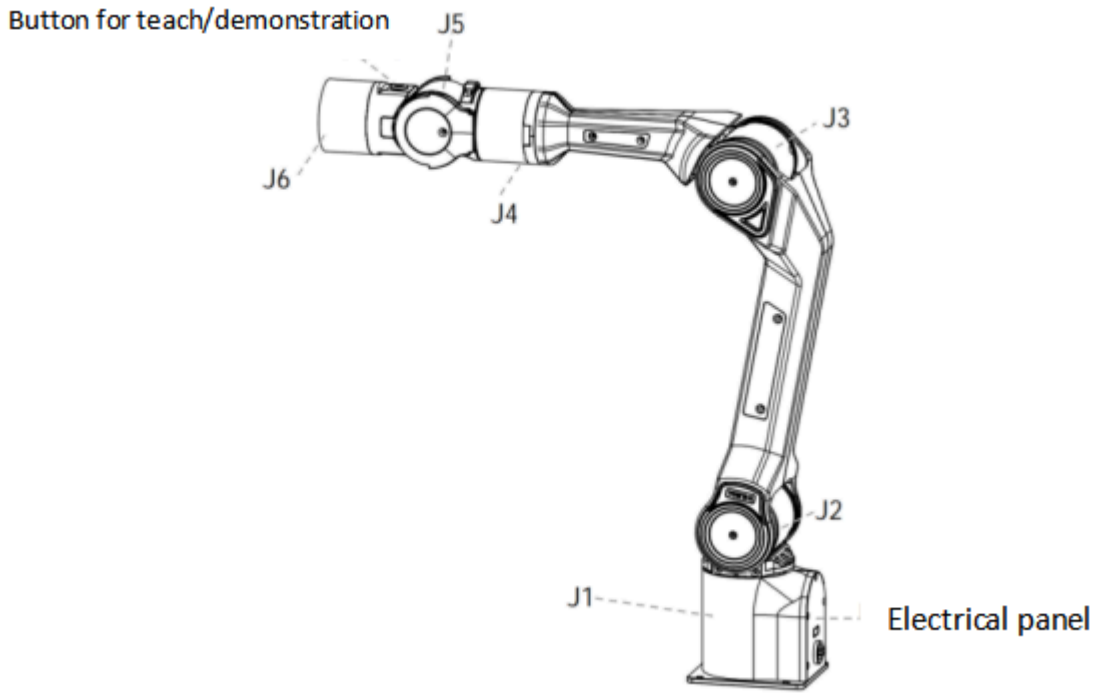
Modified DH Parameters

Link	d (mm)	a (mm)	alpha (radians)	offset
L(1)	123	0	0	π
L(2)	0.0	0.0	π/2	π×7.7
L(3)	0.0	285.03	0.0	162.6
L(4)	0	273.64	0	π×4.6
L(5)	0	74.66	–π/2	π/2

L(6)	35.26	0.0	π/2	0

2. Basic Introduction

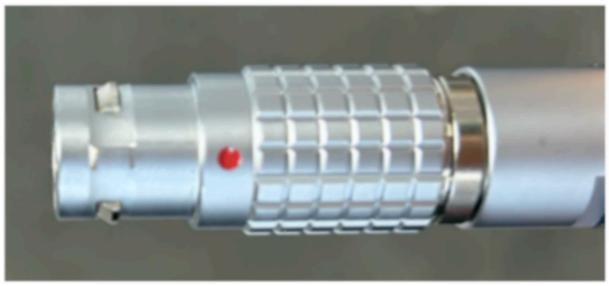
This robotic arm has 6 degrees of freedom and a 1.5 kg end-effector payload. Six rotary joints provide full-range operational flexibility with high precision and repeatability. The lightweight design enables both fast motion and high load capacity, making it suitable for embodied intelligence applications and real-world data collection.



2.1 Electrical Interface Description

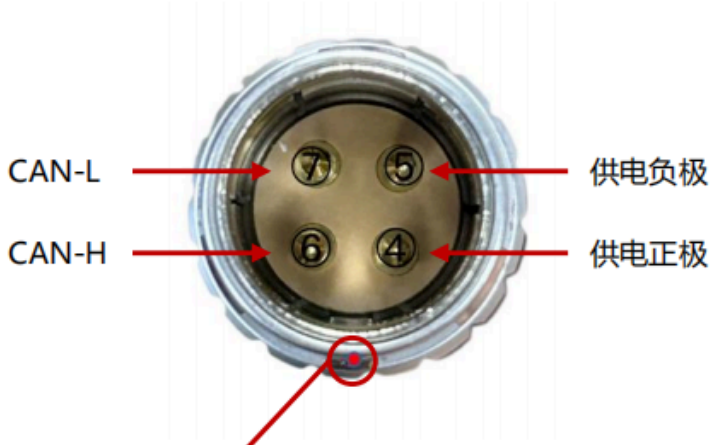
The robotic arm package includes an aviation connector, USB-to-CAN module, data cable, adapter, and a reserved XT30 2+2 interface on the end motor. Please follow the instructions below for use.

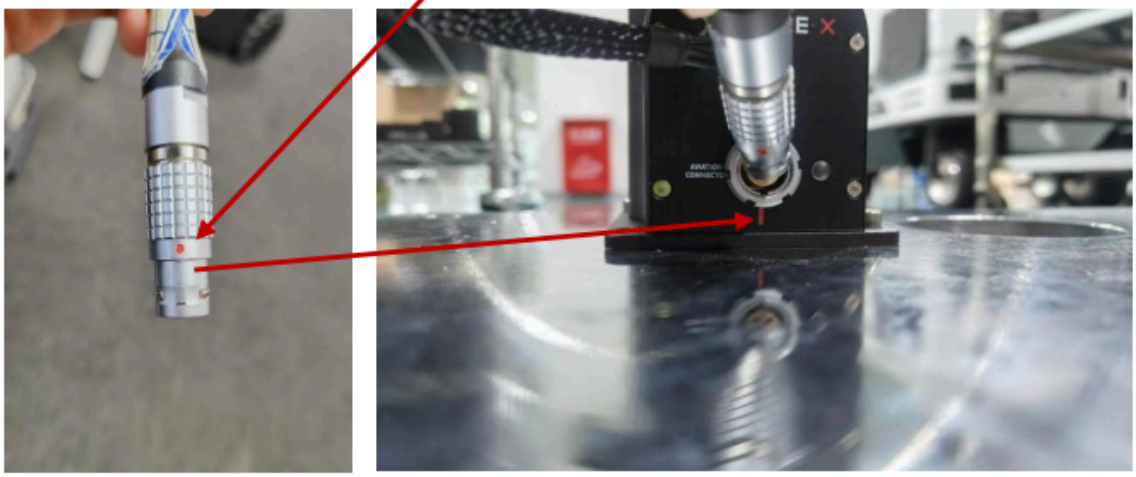
2.1.1 Arm Base Electrical Interface Diagram



1	Power & Communication Port	2	Status Indic
3	Main Controller – J2 Connection	4	Power Posit
5	Power Negative	6	CAN–H
7	CAN–L		

Note: Align the red dot on the connector with the red dot on the cable. The textured area on the aviation connector is the retractable force–bearing area. During installation, align the red dot downward with the protrusion and insert directly. To remove, press the textured area and pull out. See installation diagram below:





Electrical Panel Position 2 Indicator Light Description:

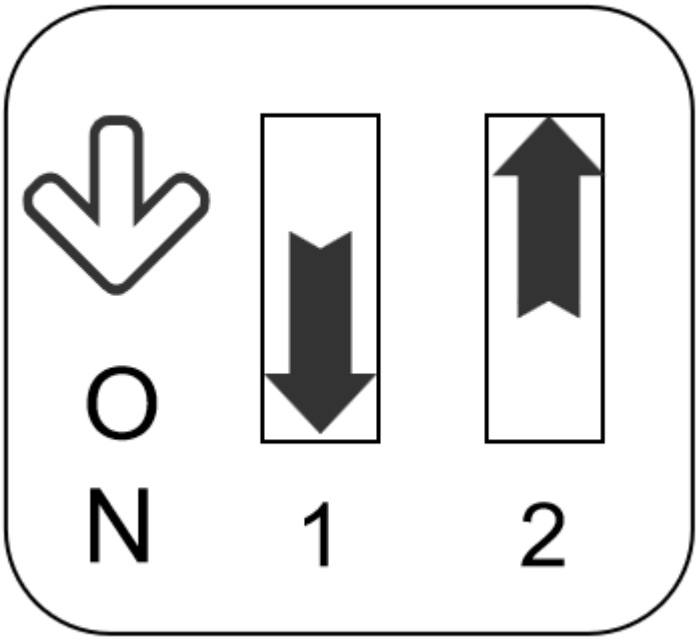
Indicator Color	Status
Green flashing	Robotic arm operating normally
Green solid	Main controller initialization/startup
Red flashing	Robotic arm error or upgrade mode; tr if error

End Joint Teaching Indicator Description:

Teaching Indicator	Status
No light	Drag teaching stopped / Trajectory rec ended
Green solid	Robotic arm in trajectory recording mo
Green flashing	Robotic arm in trajectory playback mo

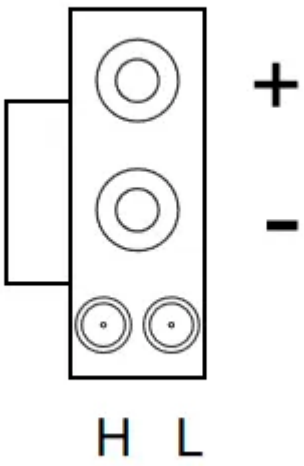
Main Controller CAN Termination Resistor Switch:

The main controller CAN termination resistor switch is used when one master arm controls multiple slave arms. **Single arm use does not require adjustment.** Factory default: 1 ON (down), 2 OFF (up), resulting in 60Ω termination. When more than two slave arms: one slave arm has 1 ON (down), 2 OFF (up); others have both 1 and 2 OFF (up).



2.1.2 End Connection Electrical Description

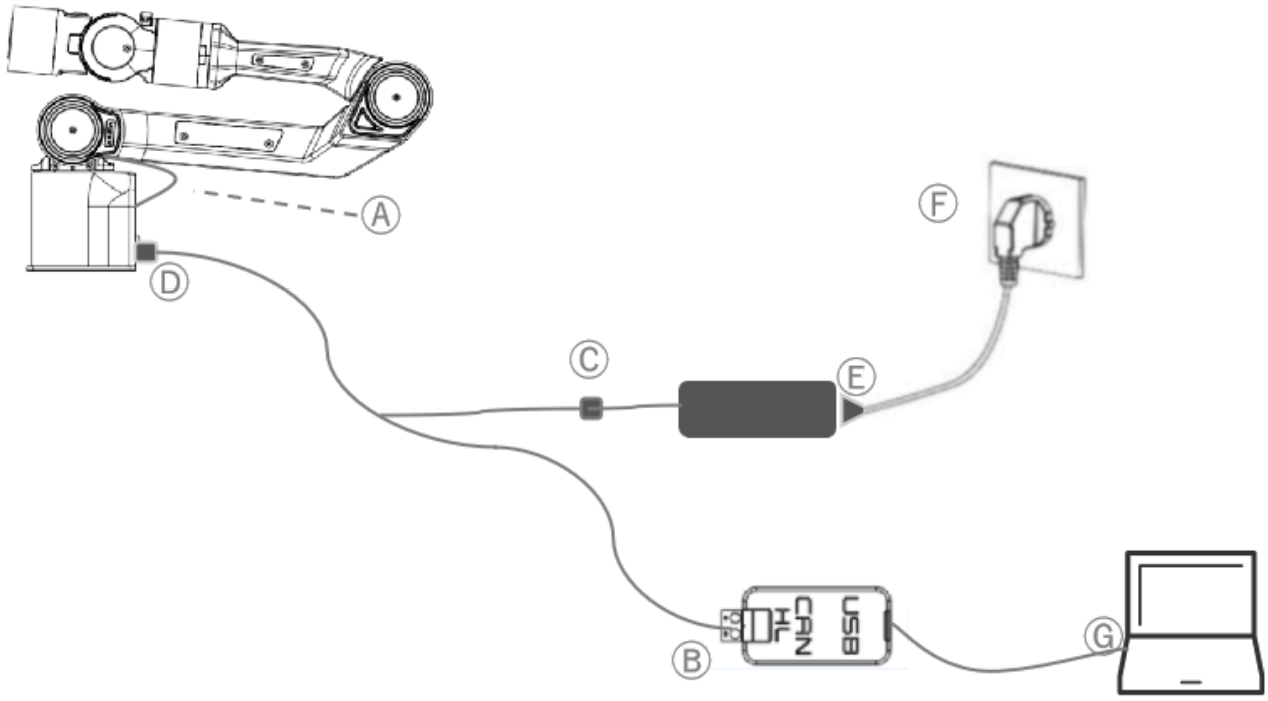
The end joint has a reserved XT30 2+2 interface for power and CAN. See diagram below. Voltage 24V, current 2A MAX. The end CAN communication is only compatible with AgileX devices. Do not connect other CAN devices without authorization, as this may cause uncontrollable damage.



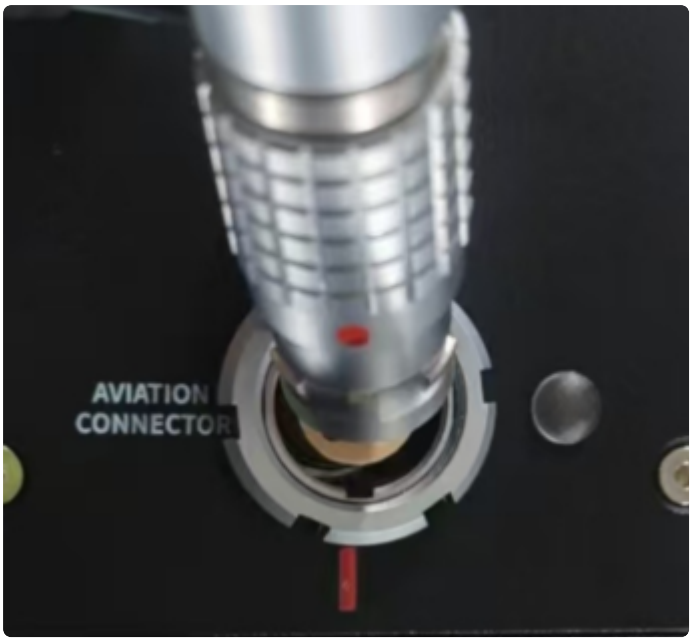
2.1.3 Power-On Instructions

For first power-on, follow steps A-G in order:

1. Connect J2 connector (A).
2. Connect CAN cables (B) on aviation connector.
3. Connect XT30 connectors (C).
4. Connect aviation connector (D) with red dot downward.
5. Connect adapter plug (E).
6. Check and confirm adapter AC plug is connected, power on, and wait for green indicator on electrical panel.
7. Connect USB cable to computer for use.



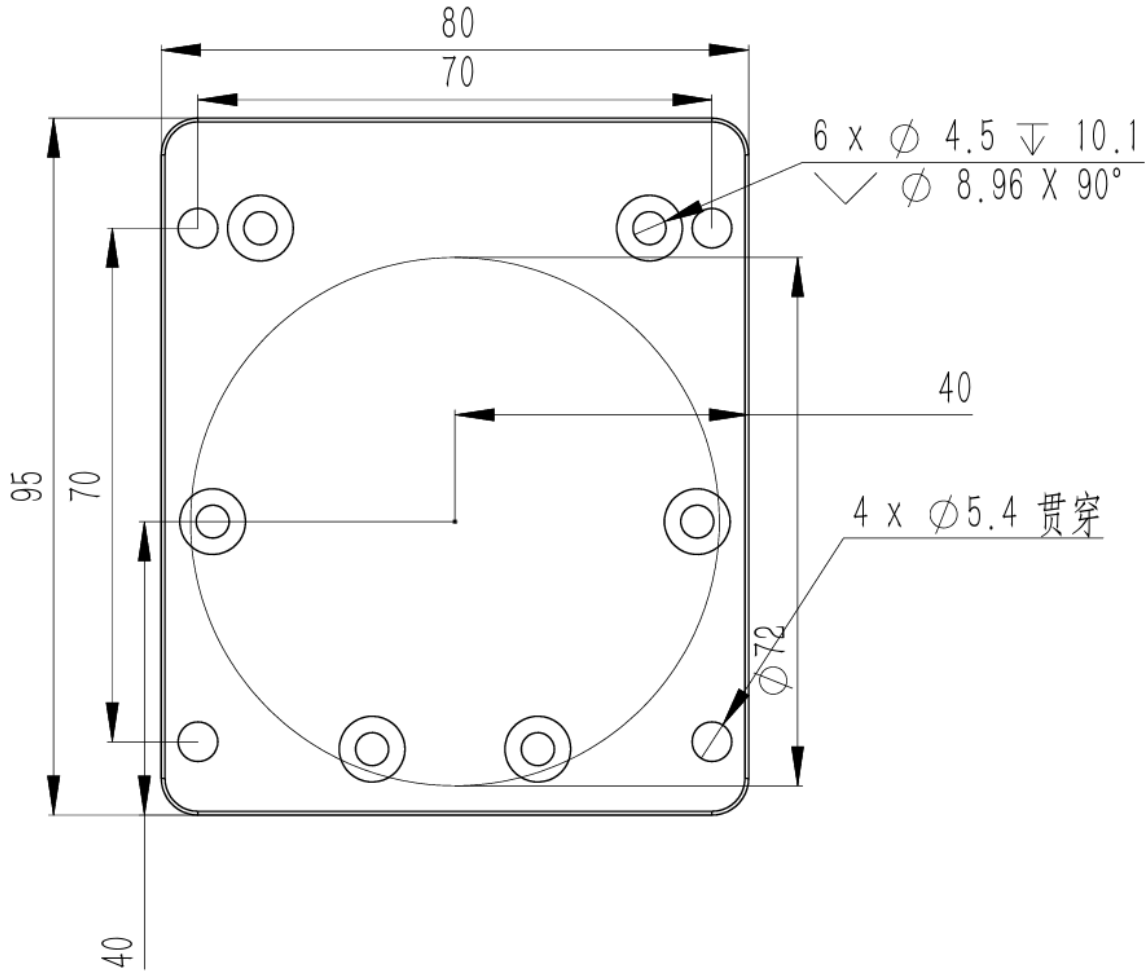
Note: Align the red dot on the connector with the red dot on the cable. The textured area on the aviation connector is the retractable force-bearing area. During installation, align the red dot downward with the protrusion and insert directly. To remove, press the textured area and pull out.



2.2 Robotic Arm Coordinate System

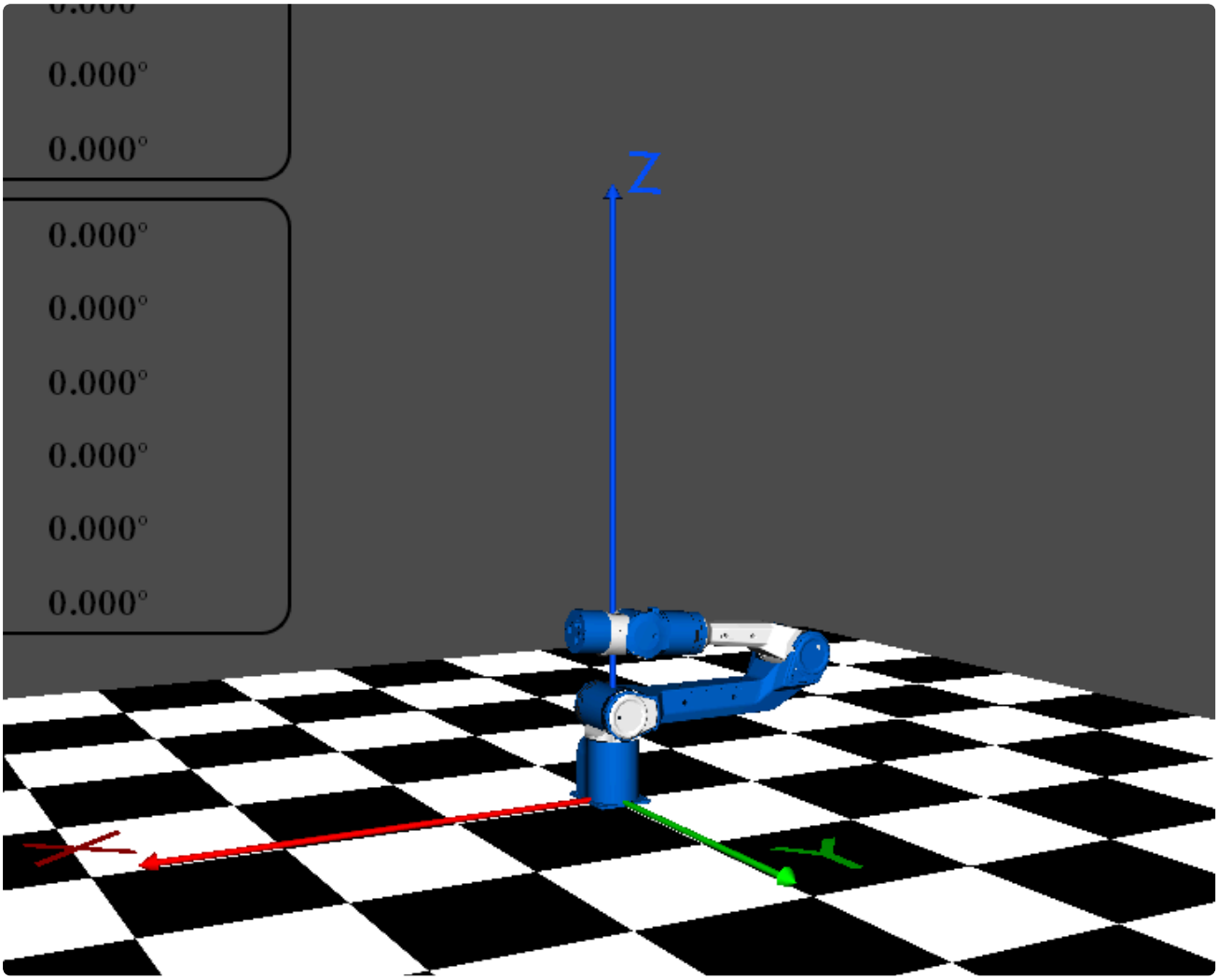
2.2.1 Origin Coordinate System (Same as PIPER Standard)

PIPER-X origin (x:0, y:0, z:0) position:



2.2.2 User Coordinate System

The user coordinate system is the robotic arm base coordinate system (Coordinate System 1 in the diagram).

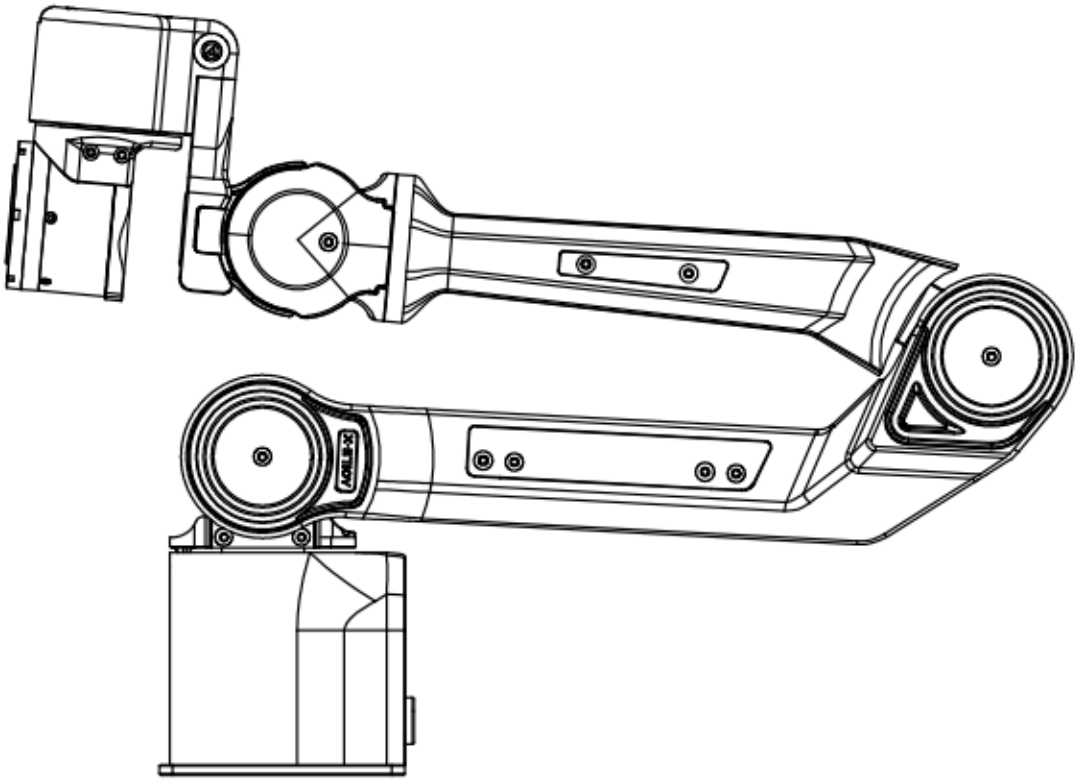


2.2.3 Singular Positions

① J1 axis coincides with J5 axis

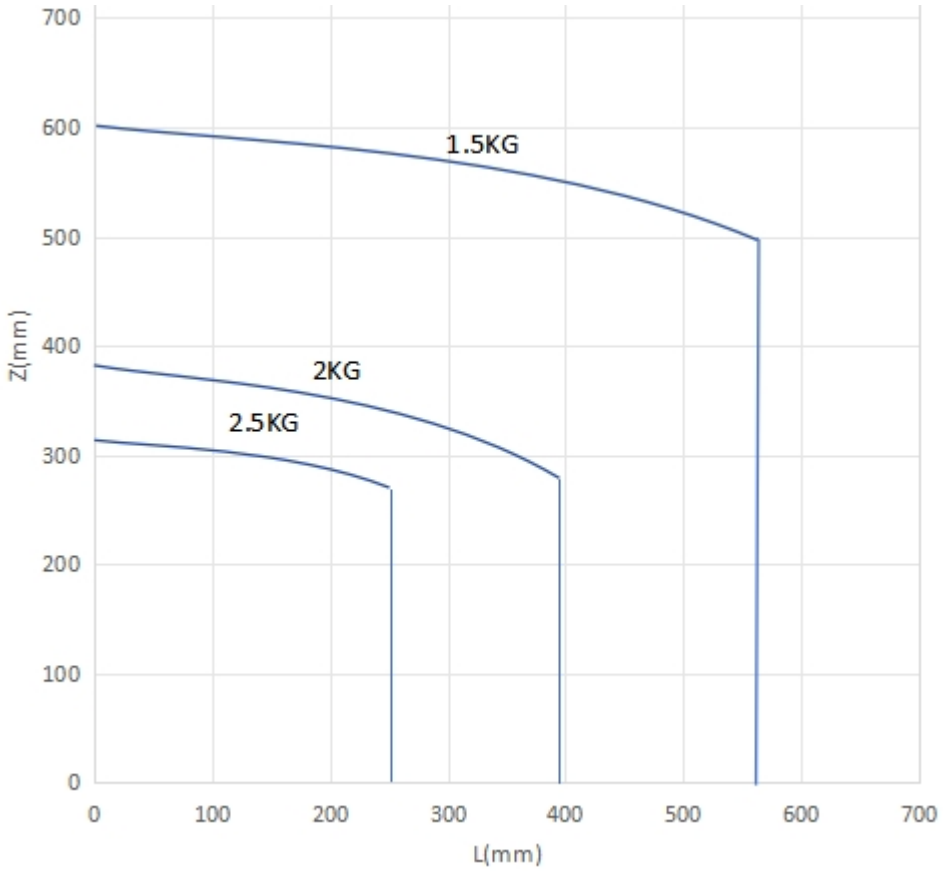
② J1 axis coincides with J6 axis

2.2.4 Zero Point Setting



Zero position as shown above: J1 aligned with base scale, J2 and J3 naturally lowered against limit, J4 raised against limit, J5 rotated clockwise against limit when facing the arm, J6 current position is zero. Click “Set All Zero Points.”

2.3 Robotic Arm Payload Curve

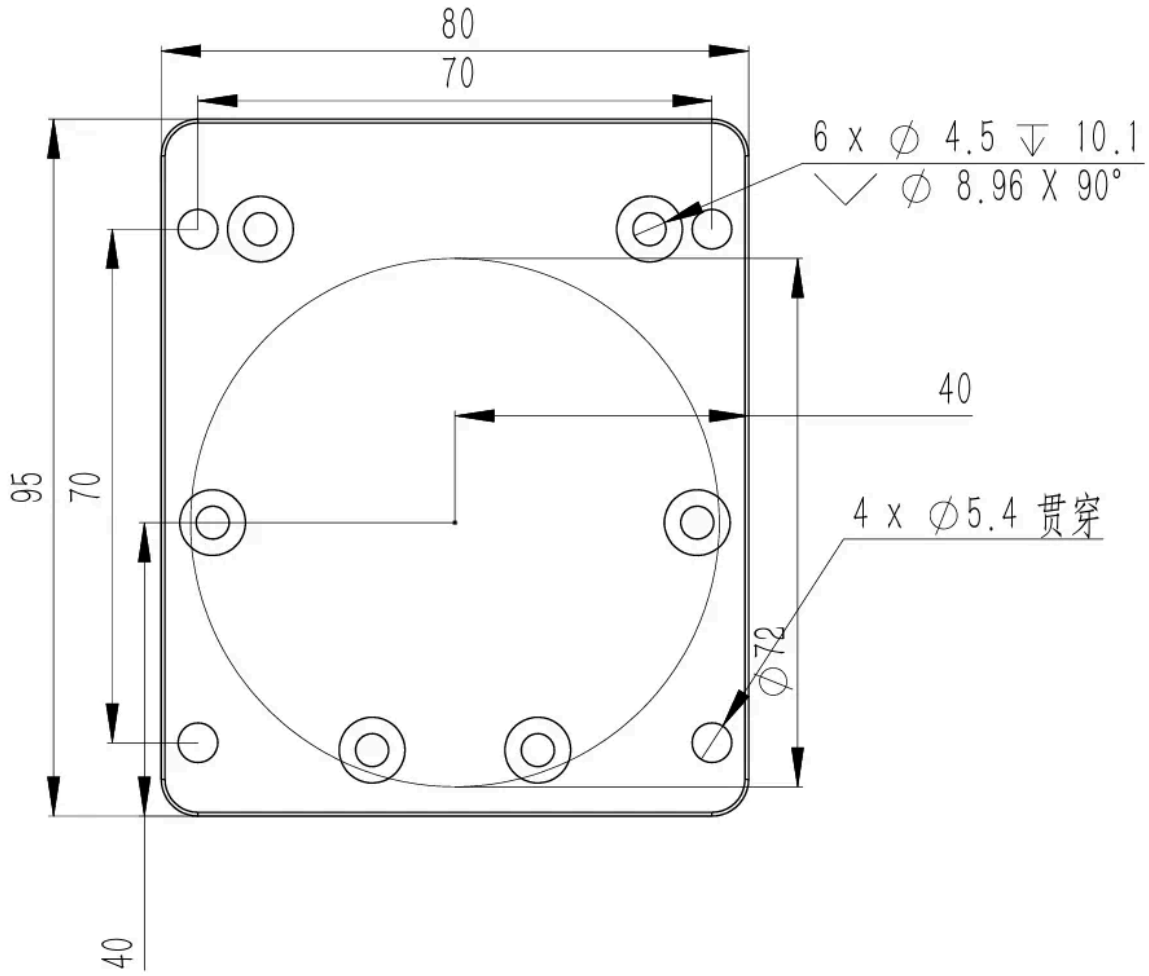


End-effector payload curve diagram

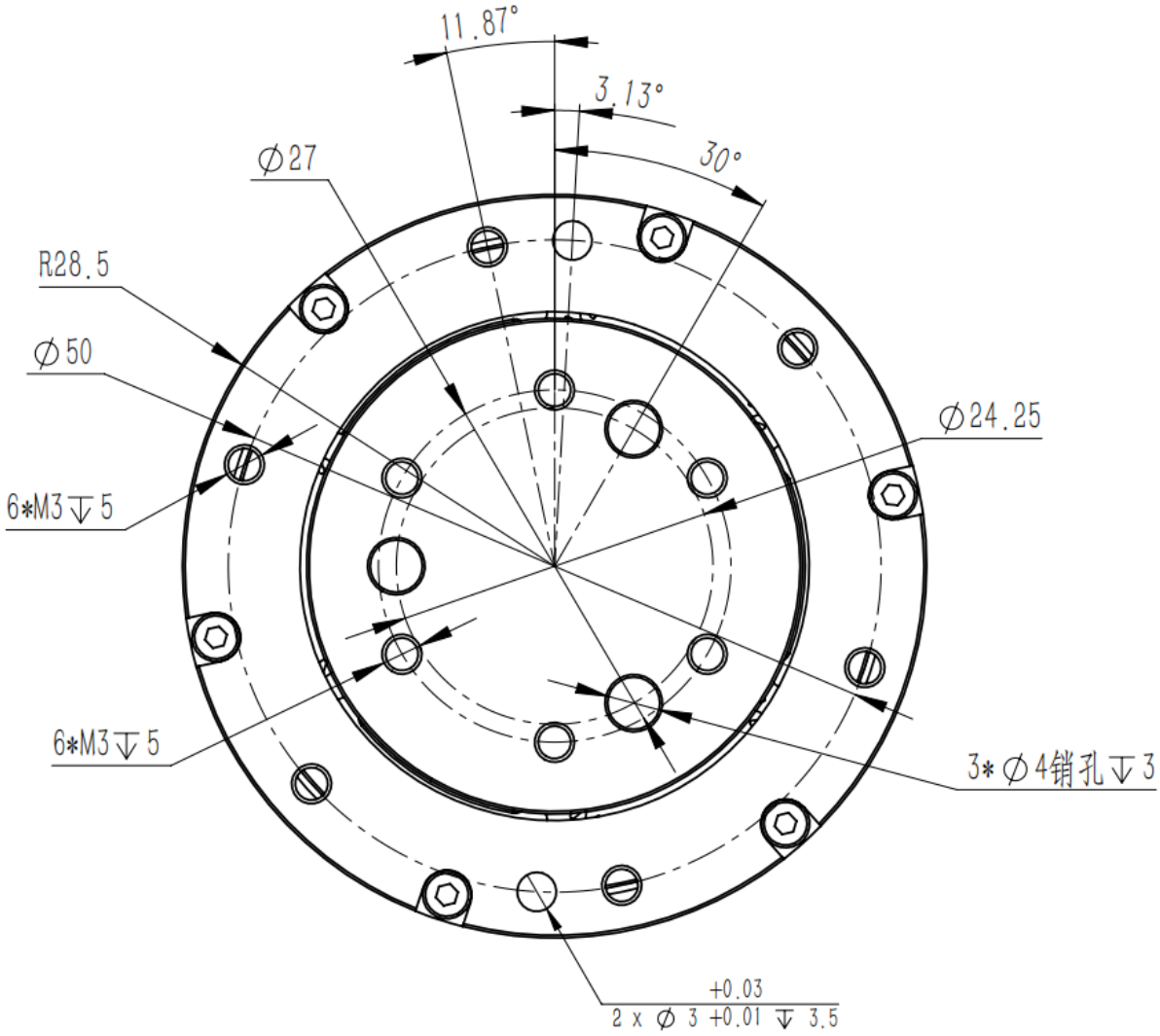
2.4 Mechanical Installation

2.4.1 Base Installation

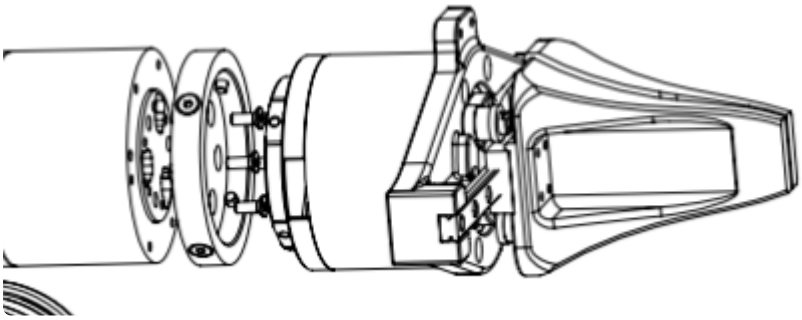
The robotic arm base is mounted using screws. The base has four M5 threaded through-holes. Four M5 screws are included. Use the included hex tool for installation. Hole spacing is 70 mm. For mobile devices or fixed surfaces, design adapter structures with 70 mm hole spacing.



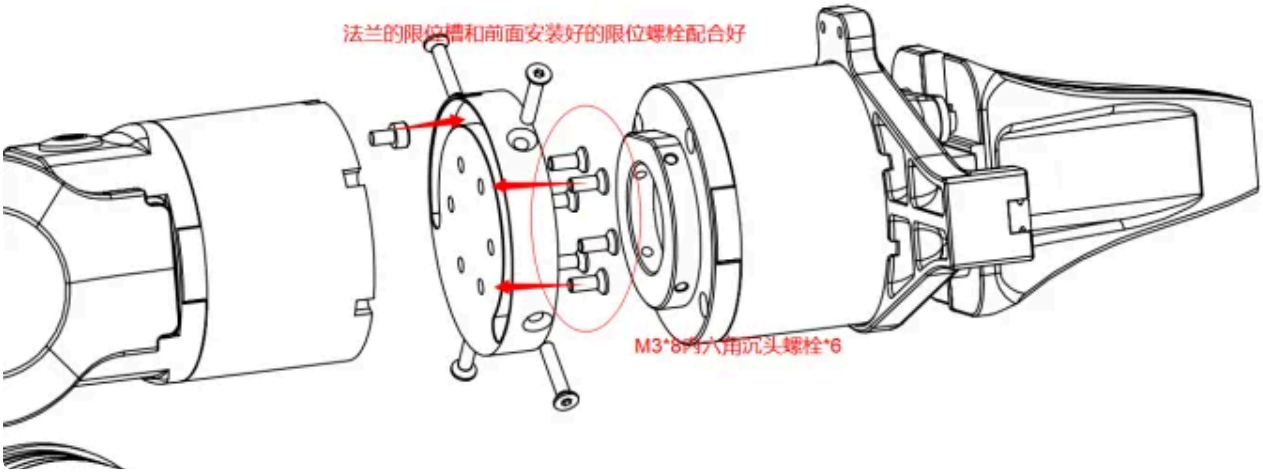
2.4.2 End-Effector Installation



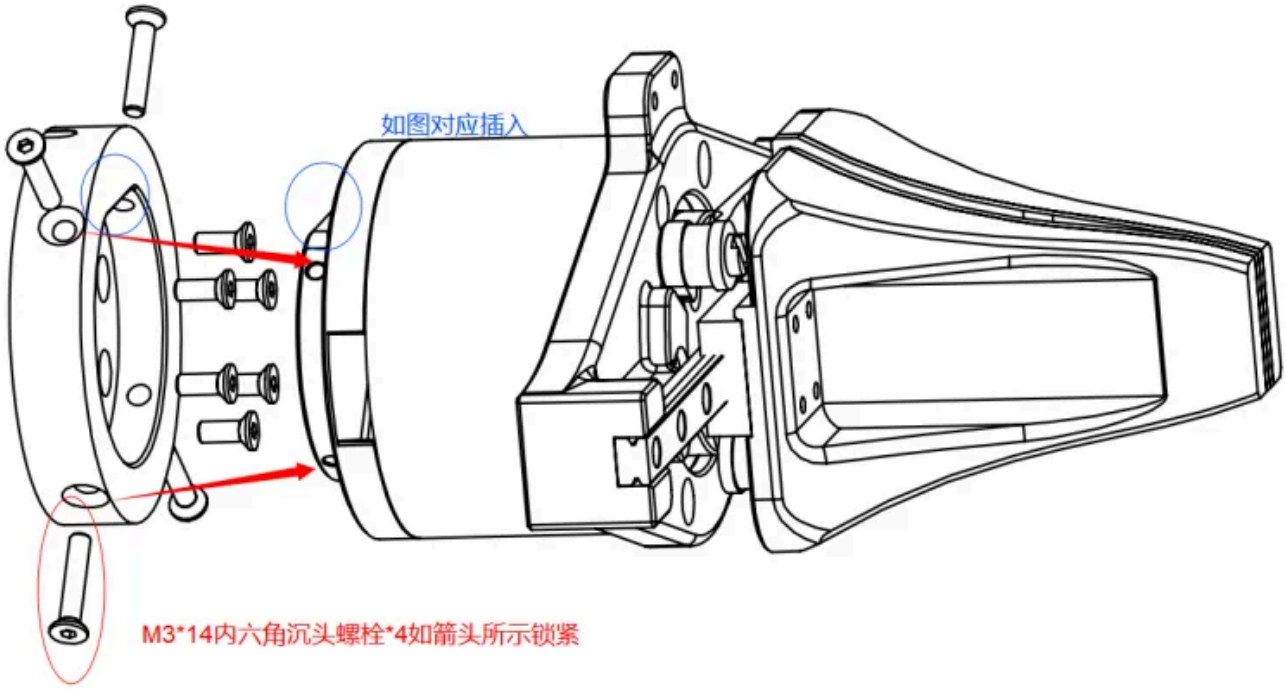
Other tools can be mounted on the robotic arm end via flange. Optional accessories include two-finger gripper and teach pendant. Installation method: Mount the two-finger gripper and teach pendant to the end via flange.



- Fix the robotic arm to the mounting surface. Remove gripper, teach pendant, flange parts, flange, and mounting bolts.
- Install limit bolts (M3×4, head diameter 4.5) at the position shown (upper left of J6 motor when viewing).
- Align the flange limit slot with the installed limit bolt, then secure with six M3×8 hex socket cap screws.

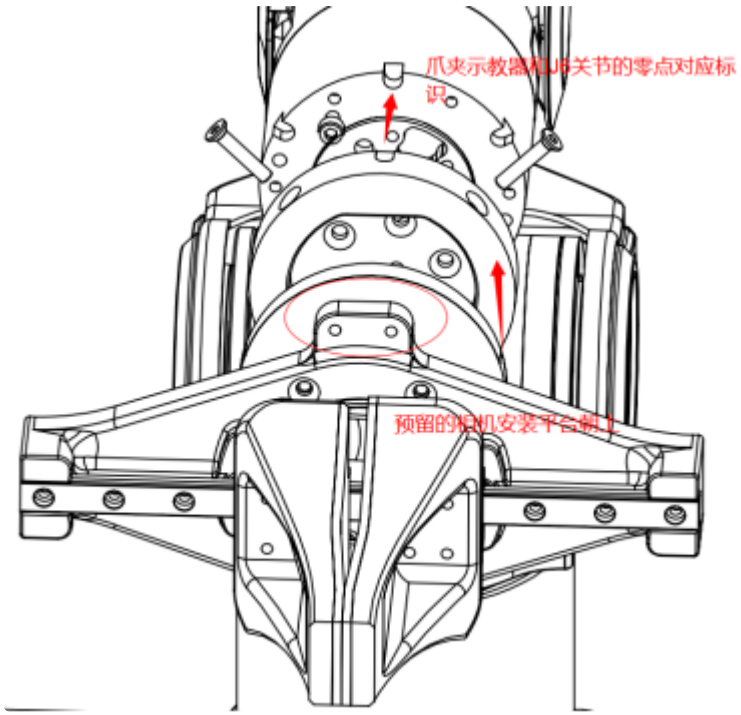


- After installing the flange, take out the gripper and teach pendant. The back covers have fool-proof design. Insert the gripper/teach pendant and secure with M3×14 hex socket cap screws.



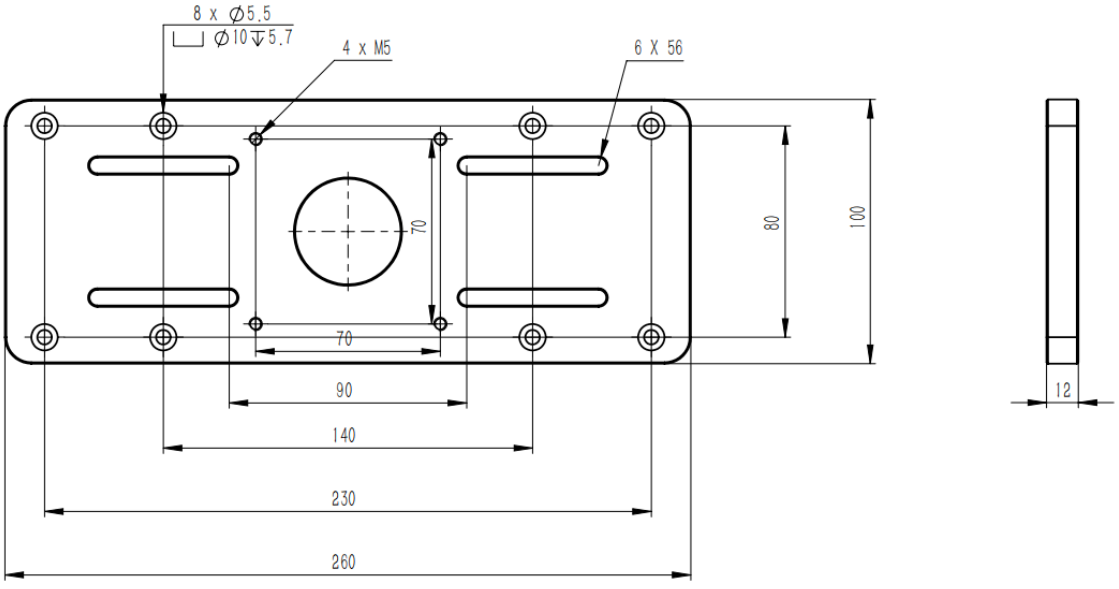
- After installing gripper/teach pendant, connect the power and communication cable from the accessory pack to J6 and the gripper/teach pendant.
- Connect the aviation cable to the robotic arm. Connect the USB-to-CAN module and aviation cable (yellow to CAN-H, blue to CAN-L). Connect the USB-to-CAN module to the computer via USB. Connect the aviation cable to the adapter and power on.
- After power-on, observe green slow flash on the base. Open the host software. After communication is established, rotate the gripper/teach pendant to the limit position as

shown, then click “Set J6 Joint Zero.” After setting, enable the robotic arm and use the host to return J6 to zero. Verify J6 and gripper/teach pendant zero marks align.



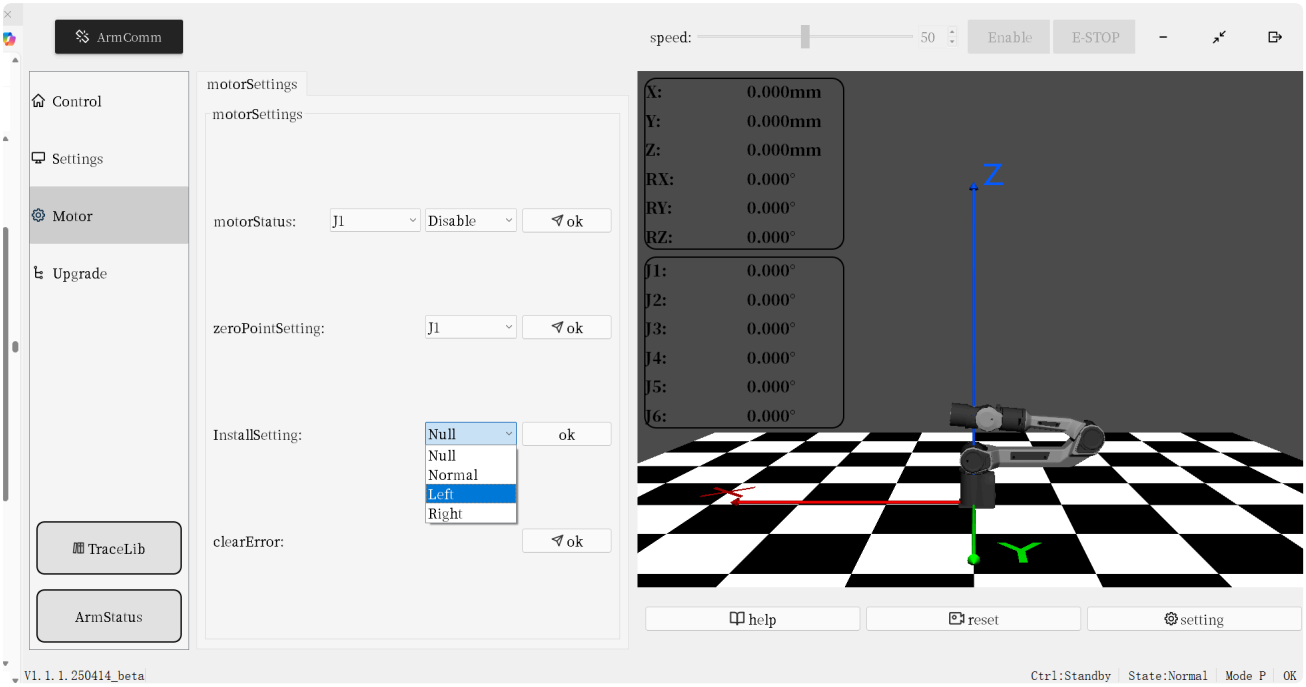
2.4.3 Desktop Installation

The desktop installation module is optional. Standard products do not include this part. Contact us for separate purchase if needed. Dimensions as shown below. Ensure secure mounting before using the robotic arm.



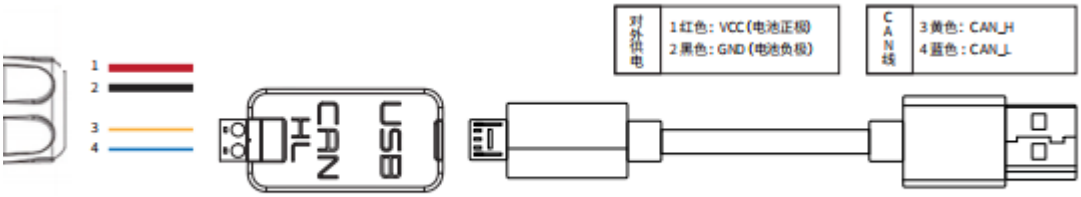
2.4.5 Robotic Arm Mounting Orientation

Different mounting orientations require different settings. Configure mounting orientation in the host software motor configuration according to the installation position.



3. CAN Connection and Preparation

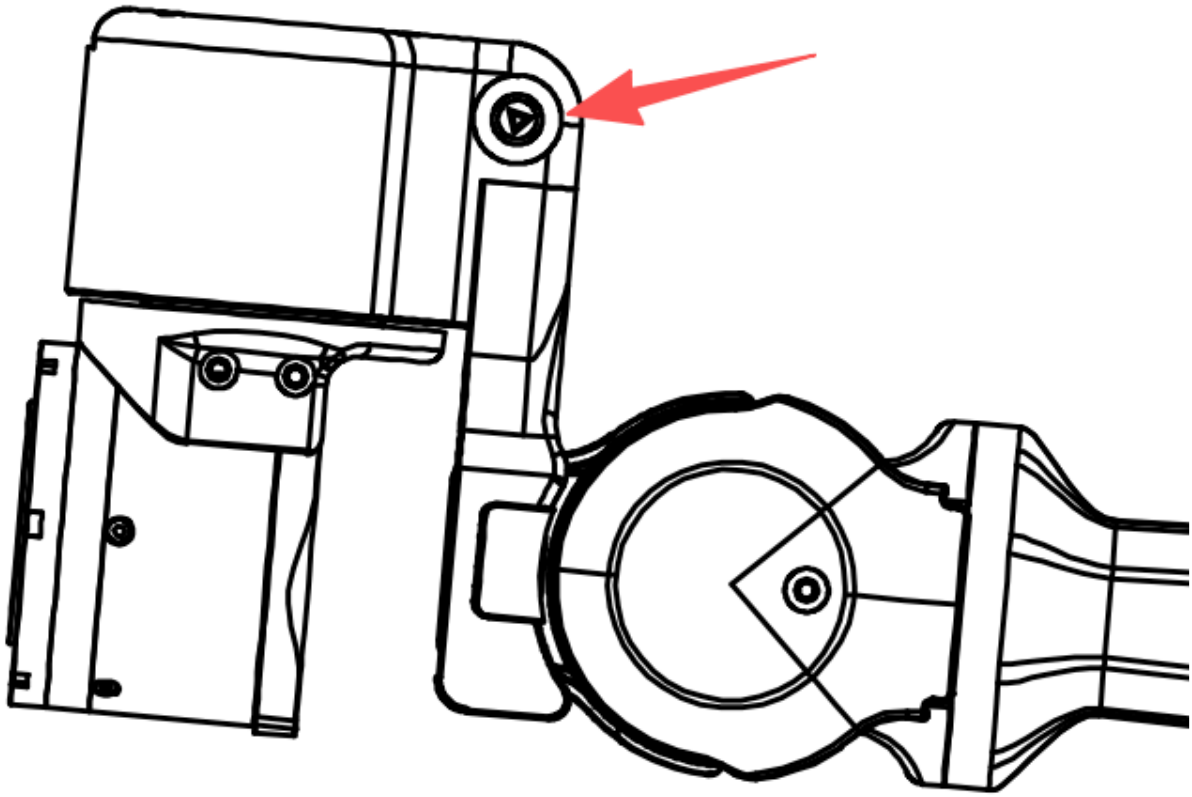
Connect the CAN wires from the connector. Connect CAN_H and CAN_L to the CAN-to-USB adapter respectively. Connect the CAN-to-USB adapter to the laptop USB port. See connection diagram below.



Note: If using a non-standard charger, power input must not exceed 26V and current must not be less than 10A.

3.1 Teaching Mode Instructions

The robotic arm drag teaching state is indicated by the button indicator.



3.1.1 Robotic Arm Status Indicator

1. No light: Drag teaching stopped / Trajectory recording ended.
2. Green solid: Robotic arm in trajectory recording mode.
3. Green flashing: Robotic arm in trajectory playback mode.

3.1.2 Switching Drag State

1. Single click: Switch between trajectory recording and recording ended.
2. Double click: Enter trajectory playback mode.

3.1.3 Usage Instructions

First observe the indicator state:

1. If no light: Single click to enter trajectory recording. Green light should be solid. Drag the arm to record.
2. If no light and trajectory was previously recorded: Double click to enter playback. Green light flashes at 500 ms. The arm will replay the recorded trajectory once.
3. If light is solid: Recording in progress. Single click to end recording.

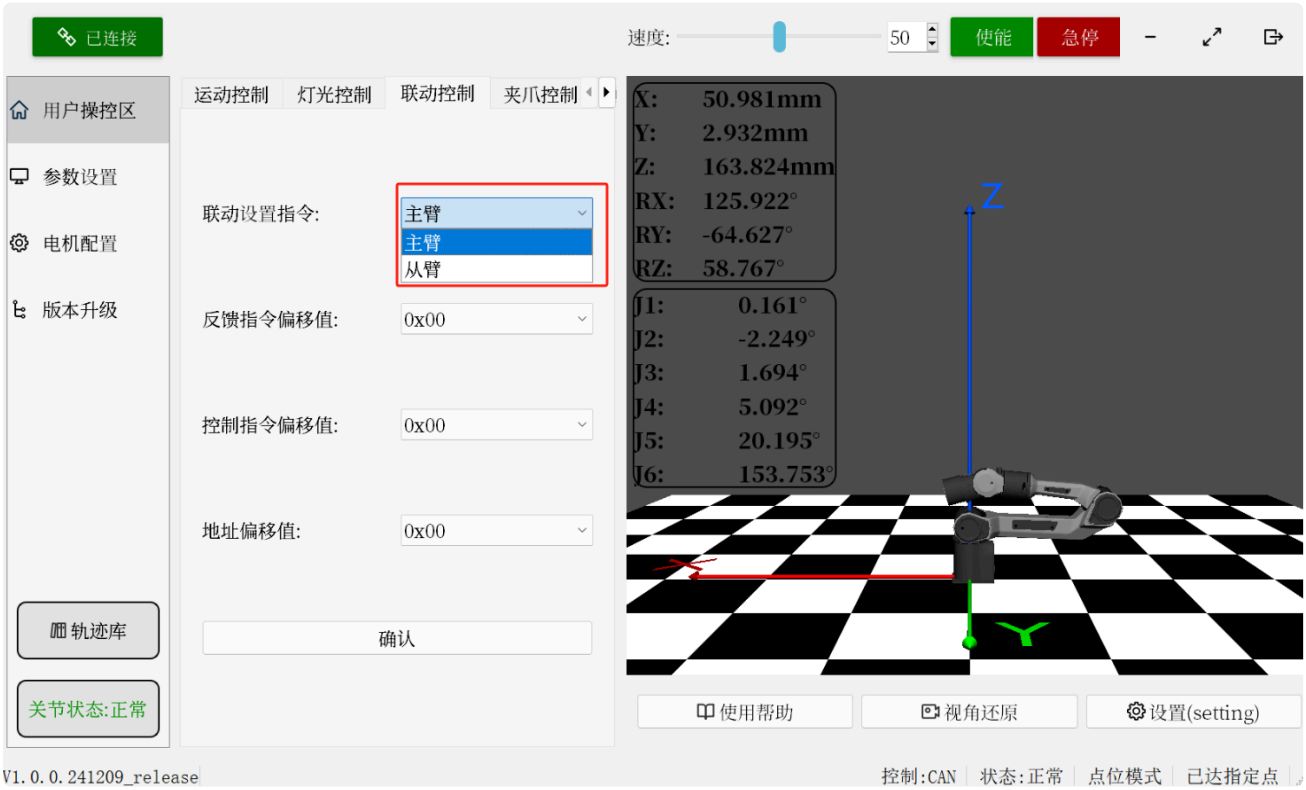
4. If light is flashing: Playback in progress.

Precautions:

1. During playback, maintain a safe distance from the robotic arm.
2. Each time the arm enters recording mode, the previous trajectory is cleared. Playback uses the most recently recorded trajectory.
3. Maximum recording time is 3 minutes. Trajectories exceeding this are invalid.
4. After using drag teaching, ensure the indicator is off (teaching stopped).
5. For host motion control or command control, ensure the indicator is off, then switch operation mode to standby via host, then switch standby to CAN mode. Same for command control: send standby mode, then CAN control mode.

3.2 Dual-Arm Cascade and Teleoperation

For dual-arm cascade control and teleoperation, first use the host to set master and slave modes for each arm. The linkage control area is shown below. For dual-arm linkage, configure input/output states and offset values on this page. Connect both arms' USB-to-CAN to the same computer.



4. Host Software Instructions

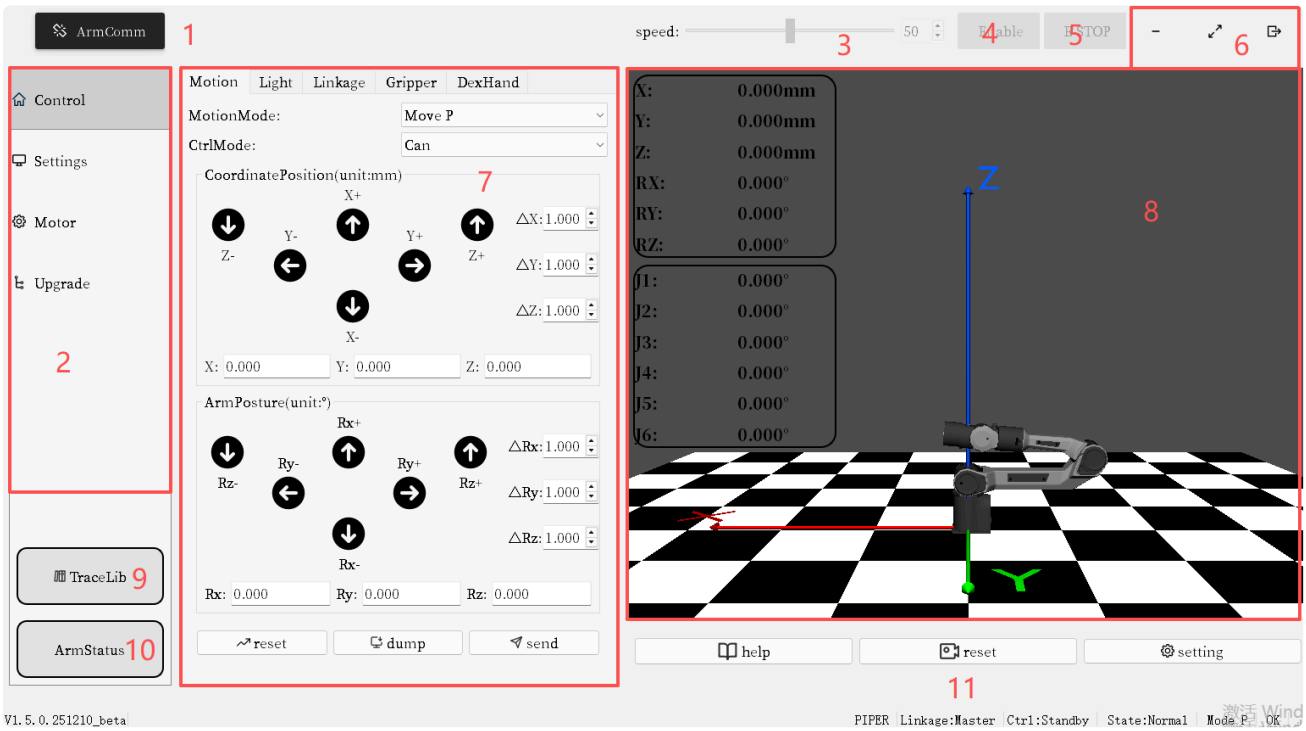
4.1 ArmRobotUA Introduction

Software download: (Same as PIPER standard version)

ArmRobotUA_V1.5.0.251210_beta (1).zip
<https://agilexsupport.yuque.com/attachments/yuque/0/2026/zip/39017709/1772762047575-c5025ff3-d7a0-4112-a178-901dc6dba0f7.zip>

On PC with Windows 7 or later, double-click to open the host software. This HMI software allows operation of the robotic arm and reading of feedback data. User interface:

Host software desktop icon



Host software panel function areas:

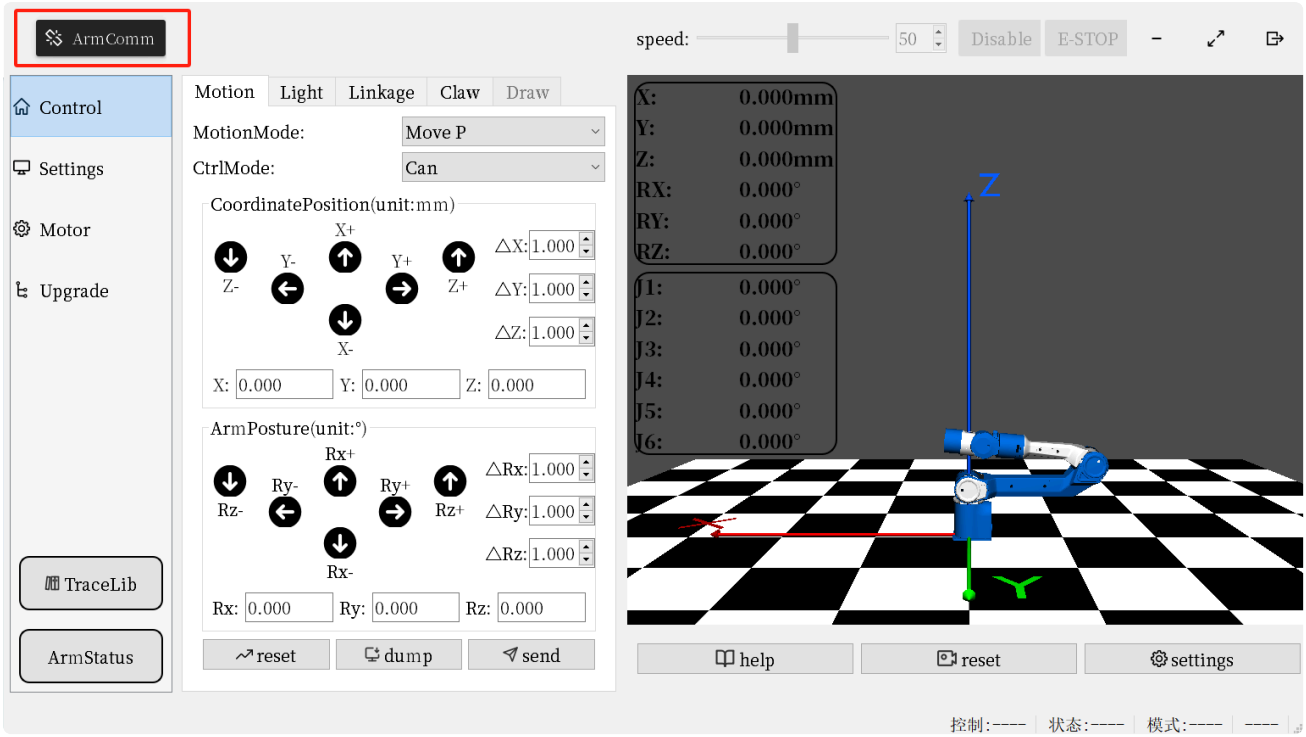
No.	Name
1	Robotic Arm Communication Button
2	Vertical Menu Bar Options
3	Speed Percentage Setting
4	Robotic Arm Enable Button
5	Robotic Arm Emergency Stop Button
6	Window Minimize/Maximize/Close But
7	Operation Function Area
8	3D Simulation Model
9	Trajectory Library

10	Robotic Arm Joint Status
11	Robotic Arm Status Bar

4.2 Robotic Arm Communication

Click setting to switch the language.

Click the communication button in the upper left. A [Connect Robotic Arm] window appears. It automatically detects CAN devices connected to the PC. Users can manually connect or disconnect selected CAN devices. On successful connection, the button displays the current status based on connected CAN devices.

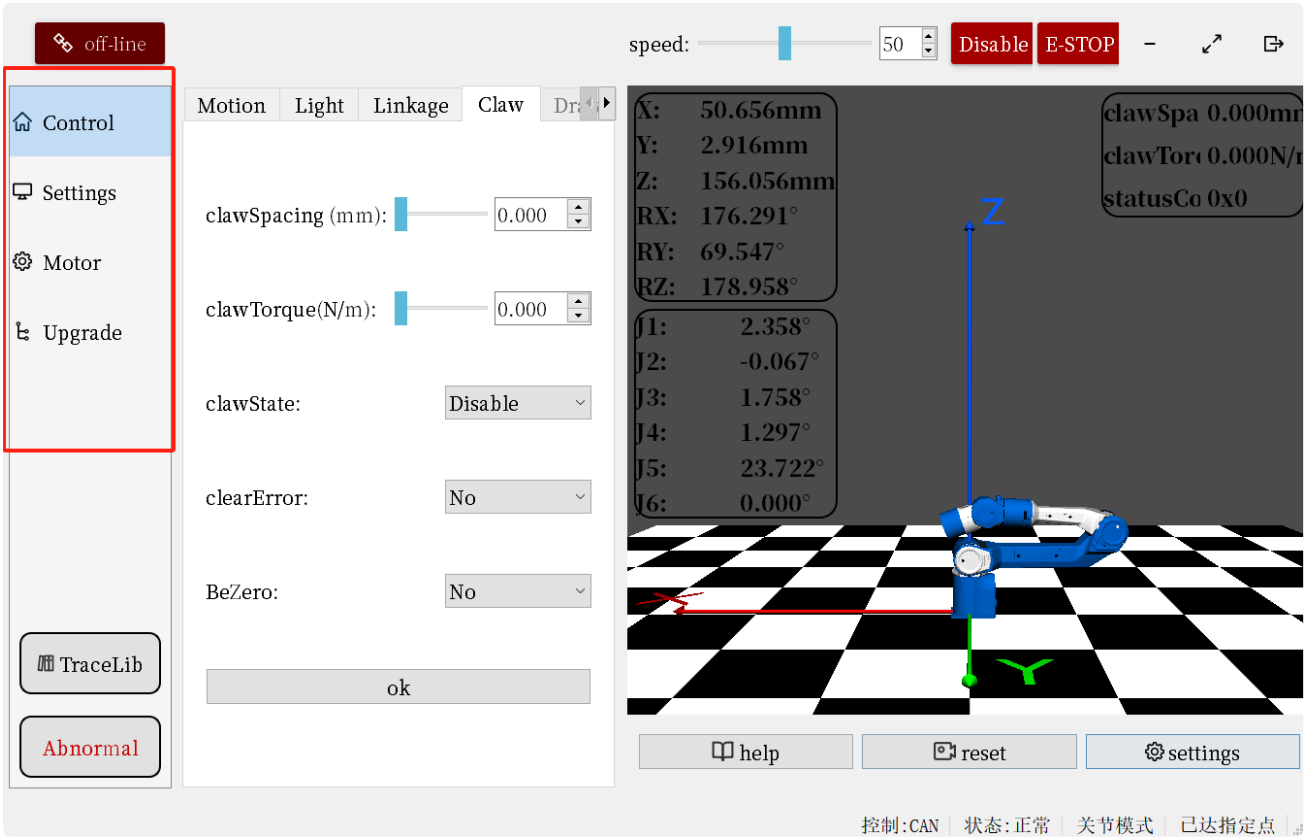


Robotic arm communication button

Robotic arm status display (left: online, right: offline)

4.3 Vertical Menu Bar

Click option names on the left to switch panels. Selected items have a light blue background.



Vertical menu

4.4 Speed Percentage Setting

After connecting the CAN device, use the speed percentage setting to set motion speed as a percentage of maximum.

Speed Percent Setting

4.5 Robotic Arm Enable Button

After successfully connecting to the CAN device, the user can press the robotic arm enable button at the top of the window. The display shows the current status of the six joints. Clicking it will reverse the positions of the six joints at the same time.

Robotic arm Enable button

4.6 Robotic Arm Emergency Stop Button

After successfully connecting to the CAN device, the user can press the robot arm emergency stop button above the window. After pressing the emergency stop button, the robot arm will immediately stop any movement. Press the button again to resume use. It can be resumed after enabling.

Robotic Arm e-stop button

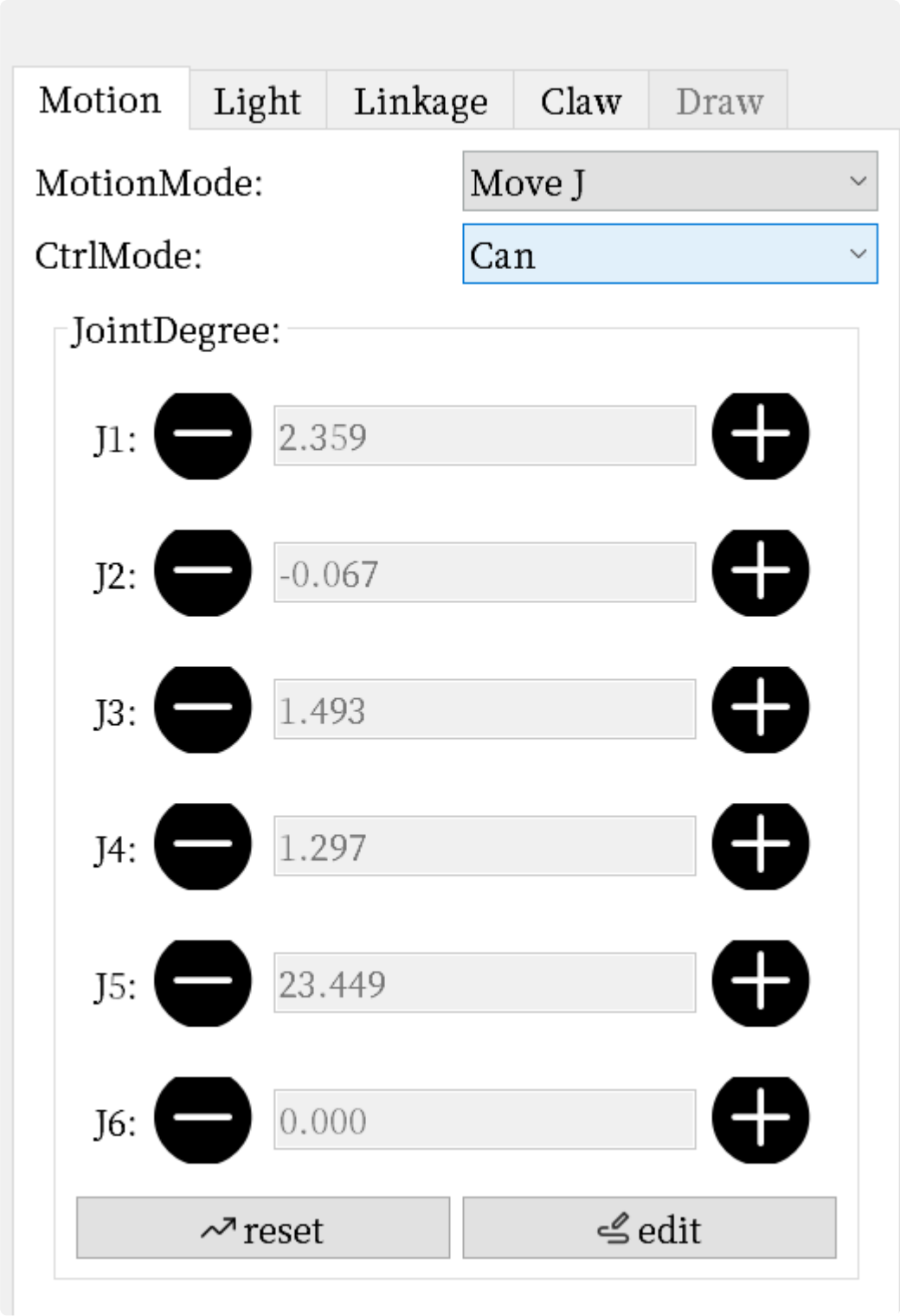
4.7 Window Minimize/Maximize/Close Buttons

The three buttons on the upper right are window minimize, window maximize, and window close. Pressing them can realize the corresponding functions of the window.

Window zoom and close button

4.8 Operation Function Area

The central area of the window is the operation function area, which can be switched synchronously by [2. Vertical menu bar options] to switch to different partitions according to user needs. For example, the figure below is the motion control area, which can realize the actual joint control of the robot arm.



Motion control area

Motion Control Modes

Motion Mode	Usage	Notes

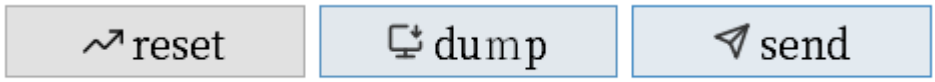
Point Motion	Enter end-effector position (x,y,z,rx,ry,rz), click Apply. The arm moves to the specified point. Can also use x/y/z icons to adjust coordinates. **Click Apply to move.**	Unreachable points v the arm; error promp appear.
Arc Motion	Enter three points: start, middle, end. The arm plans and executes arc motion.	Unreachable points i may prevent motion.
Joint Motion	Enter joint angles, click Apply. Can also use sliders. **Click Apply to execute.**	Joint angles exceedi not move.
Linear Motion	Enter position (x,y,z,rx,ry,rz). The arm moves linearly to the point.	Unreachable points i may cause no solutic
MIT Control	Select target joint, enter angle, velocity, kp, kd, torque.	Directly controls join velocity, torque. Dan contact technical sup use.

4.9 Motion Control Area

The robotic arm has a total of 6 joints, named Joint 1 to Joint 6 from bottom to top, corresponding to the 6 joint settings in the operation bar. Users can edit the joint degrees by themselves or click the plus and minus buttons to realize the joint operation of the robotic arm (unit: °).

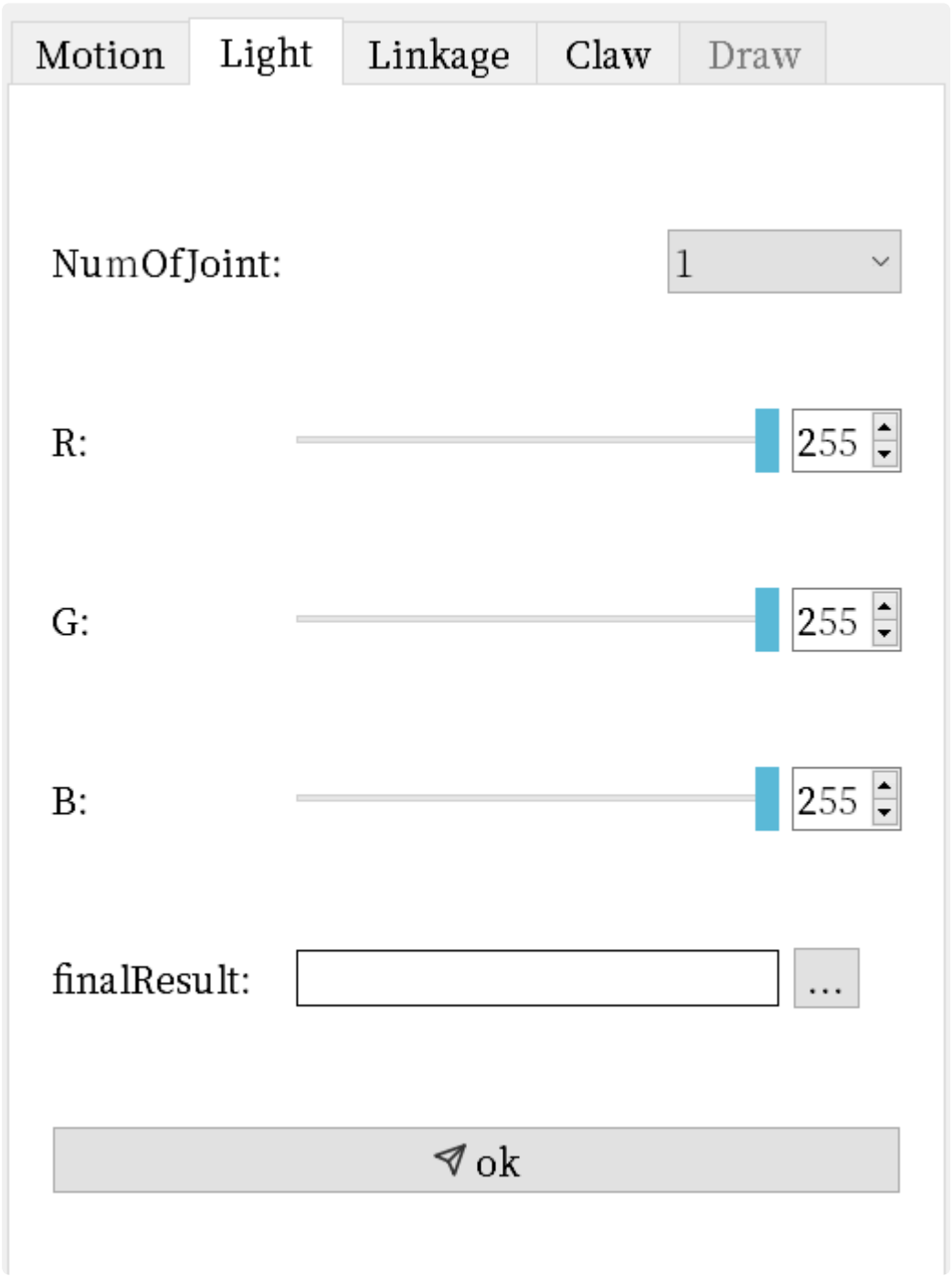
Joint degree

The 3 buttons below are ①Return to zero button, ②Load button, and ③Send button. Button ①: automatically sends the factory initial position angle value of the robot arm, button ②: fills the current degree of the 6 joints of the robot arm into the user edit bar, and button ③: sends the 6 joint degrees in the user edit bar to the robot arm. The specific content is subject to actual experience.



Joint button

The picture below shows the lighting control area. If the joint light board is installed, the lighting control of the six joints of the robot arm can be realized.



Light control area

The joint number and RGB channel above are the light board that the user needs to operate and the grayscale value of the corresponding channel. The effect bar below is the actual calculated light color. Click the [Confirm] button to operate the light board.

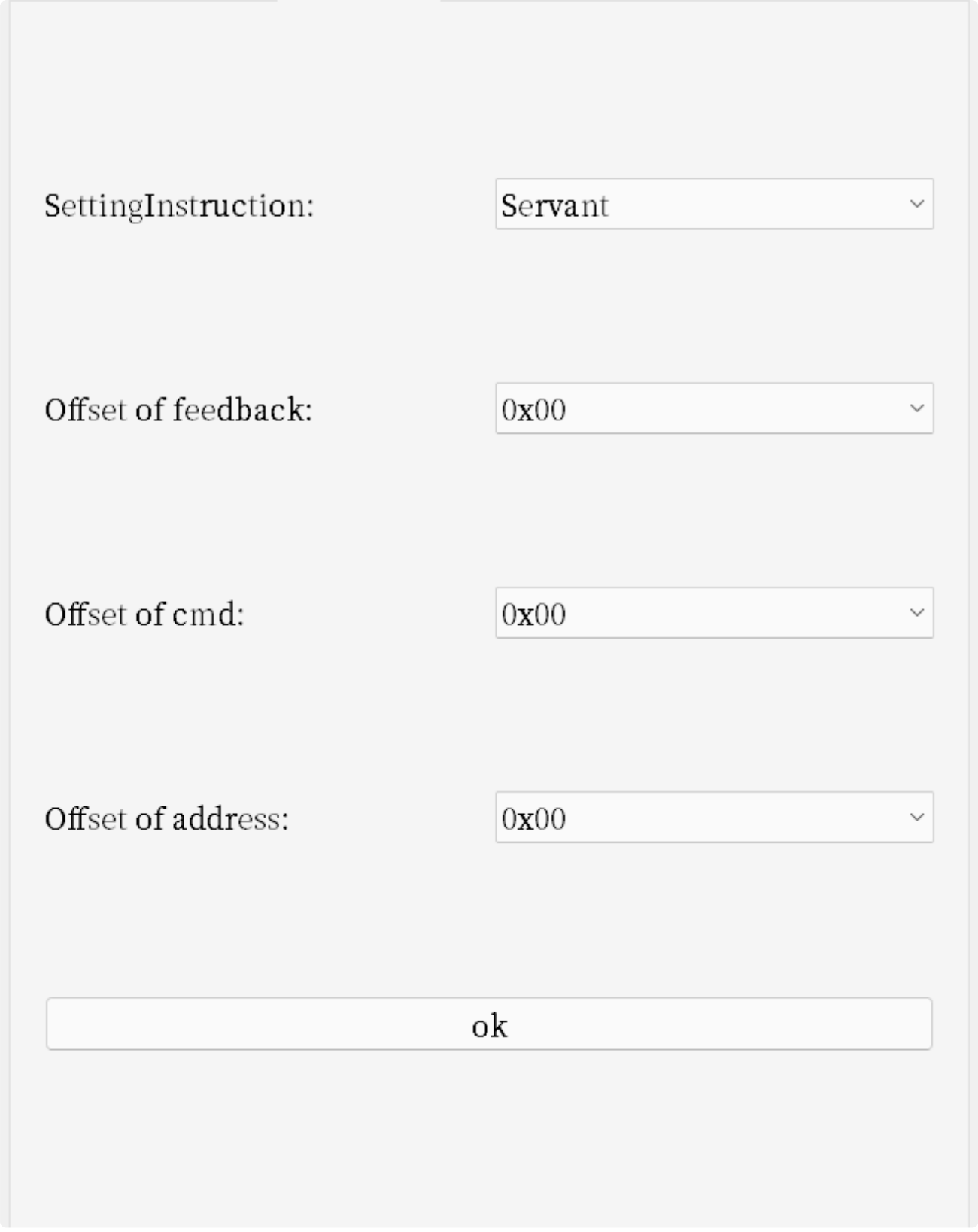
4.10 Linkage Control Area

Note:

When using the robotic arm independently (i.e., not in master–slave teleoperation mode), you must first set it to slave mode!

If the arm is set to master mode, it cannot be controlled. You will need to use the host computer to switch it back to slave mode before operation.

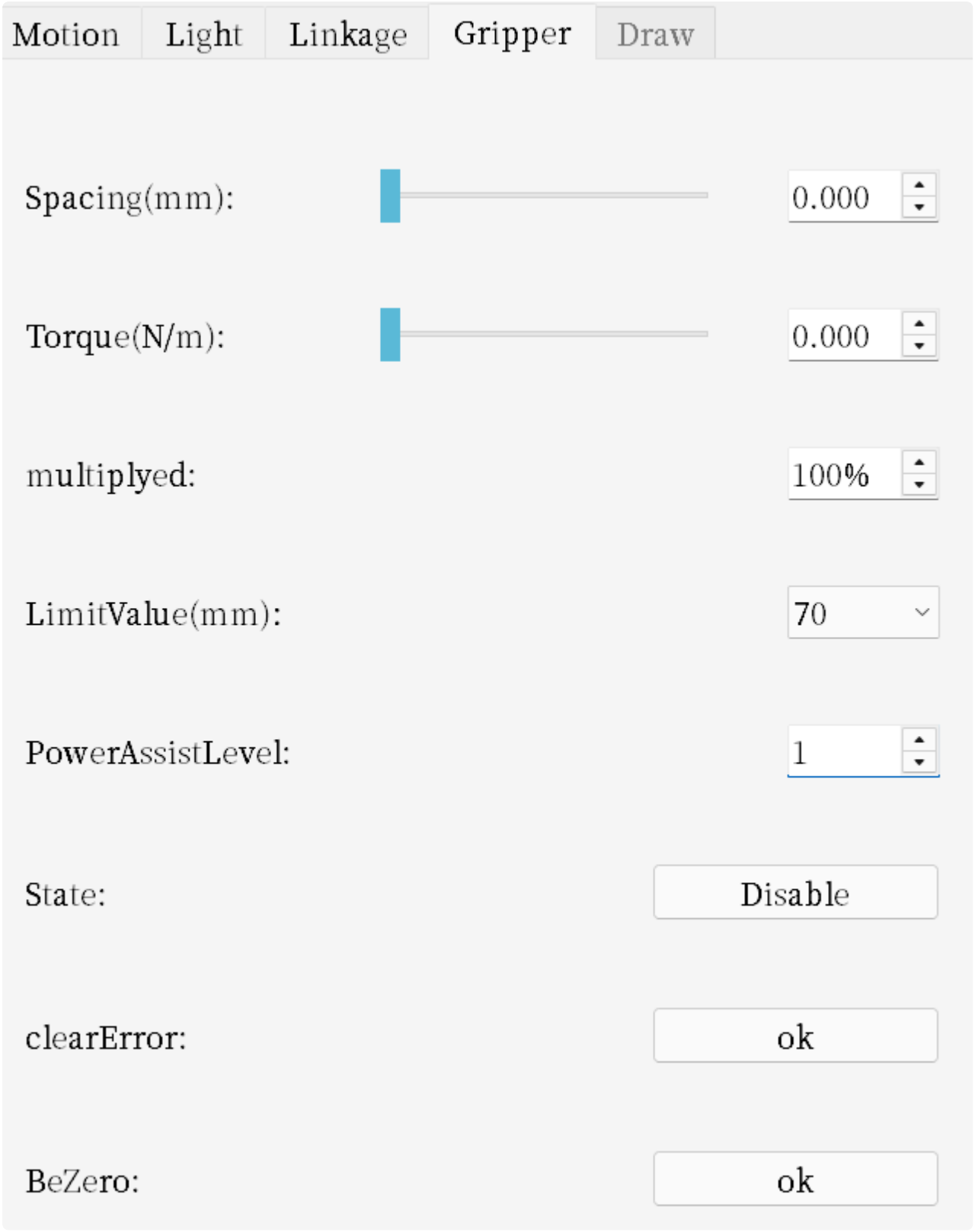
The following figure shows the linkage control area. If the user needs to achieve dual–arm linkage, the Master and servant status and offset value can be configured on this page.



Linkage control area

4.11 Gripper Control Area (Gripper Required)

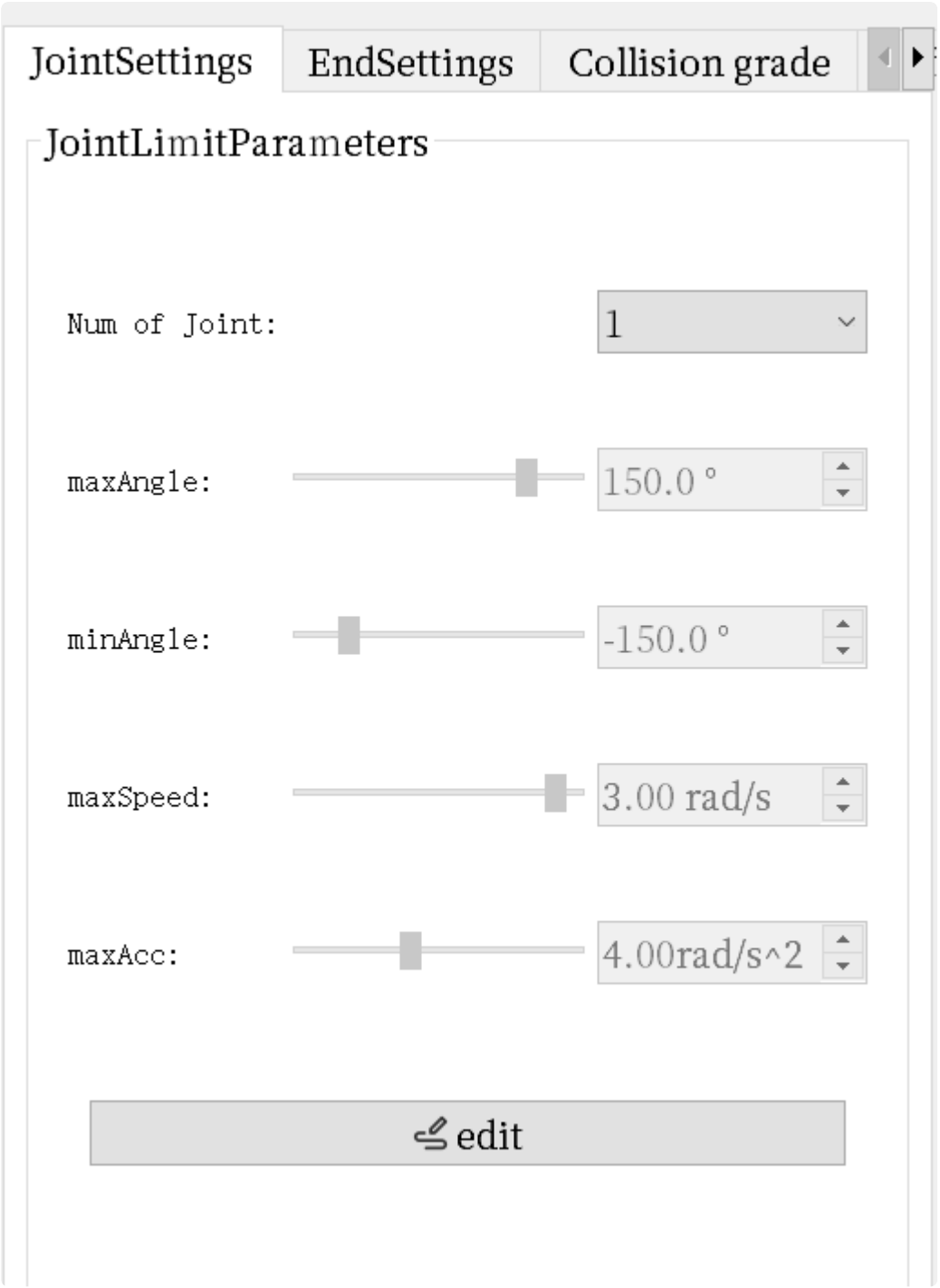
The following figure shows the gripper control area, where you can set the gripper enable status, torque value, etc. The right area of the host computer will feedback the corresponding gripper value.



Gripper/claw setting area

4.12 Joint Settings Area

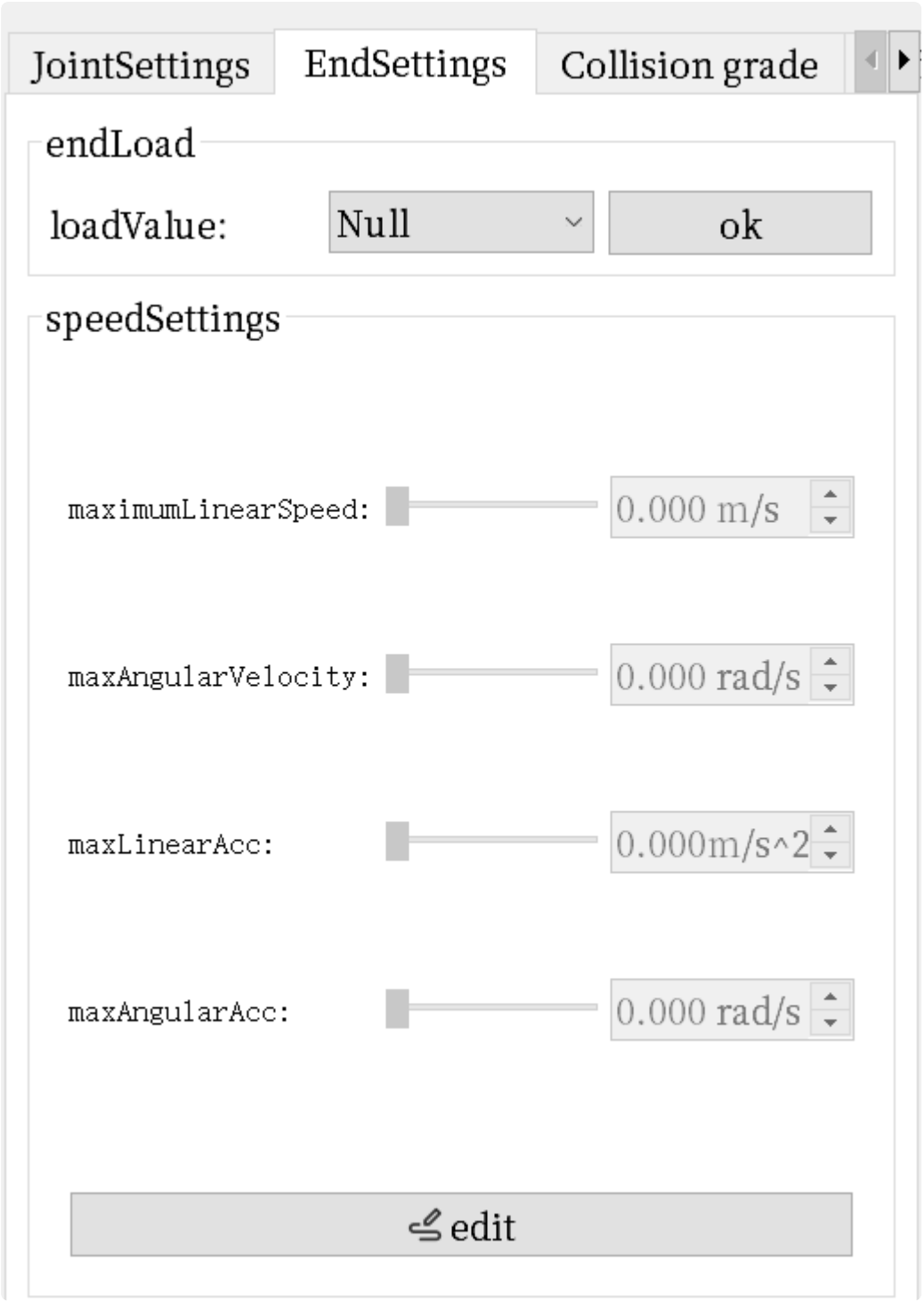
The figure below shows the joint setting area, where you can edit the maximum and minimum angles, maximum speed, and maximum acceleration of the six joints of the robot arm. The operation process is [Edit] – [Save].



Joint setting area

4.13 Speed Settings Area

The following figure shows the speed setting area, where the maximum linear speed and angular speed and the maximum linear acceleration and angular acceleration of the end of the robot arm can be set. The [Initialization button] is used to restore the factory settings.

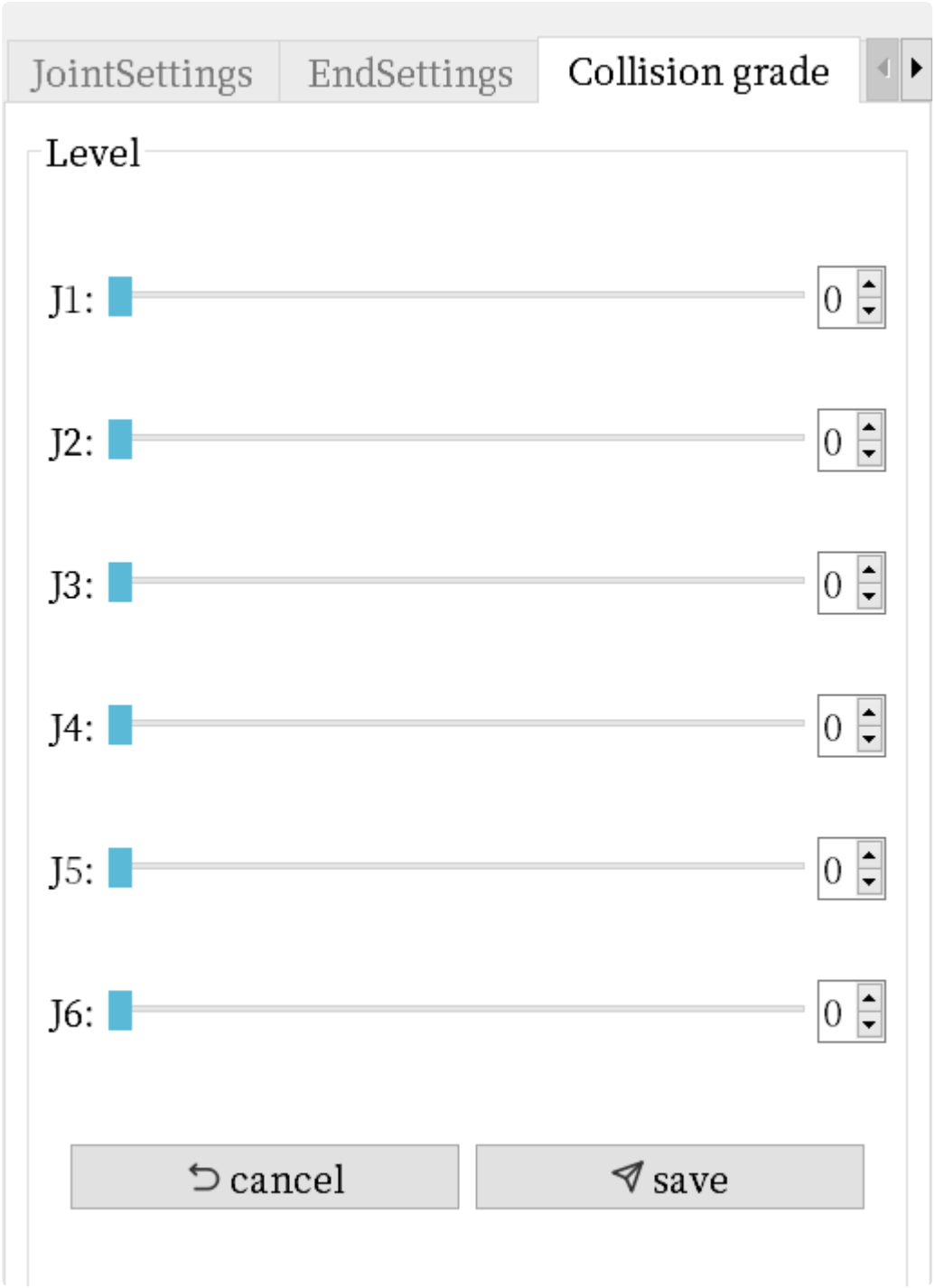


End speed setting area

Reset area

4.14 Collision Level

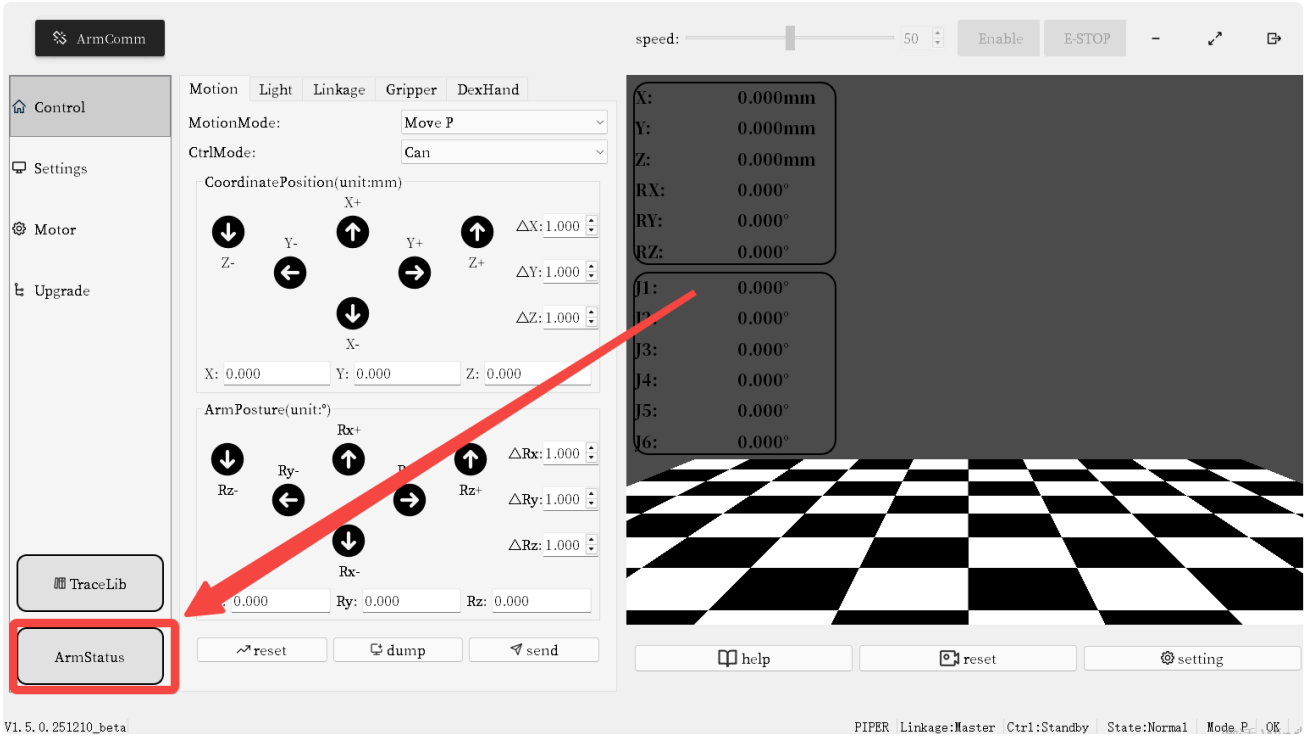
The picture shows the collision level setting. The collision level of level 1 to level 8 can be configured for the 6 joints of the robot arm. The operation process is [Edit] – [Save].

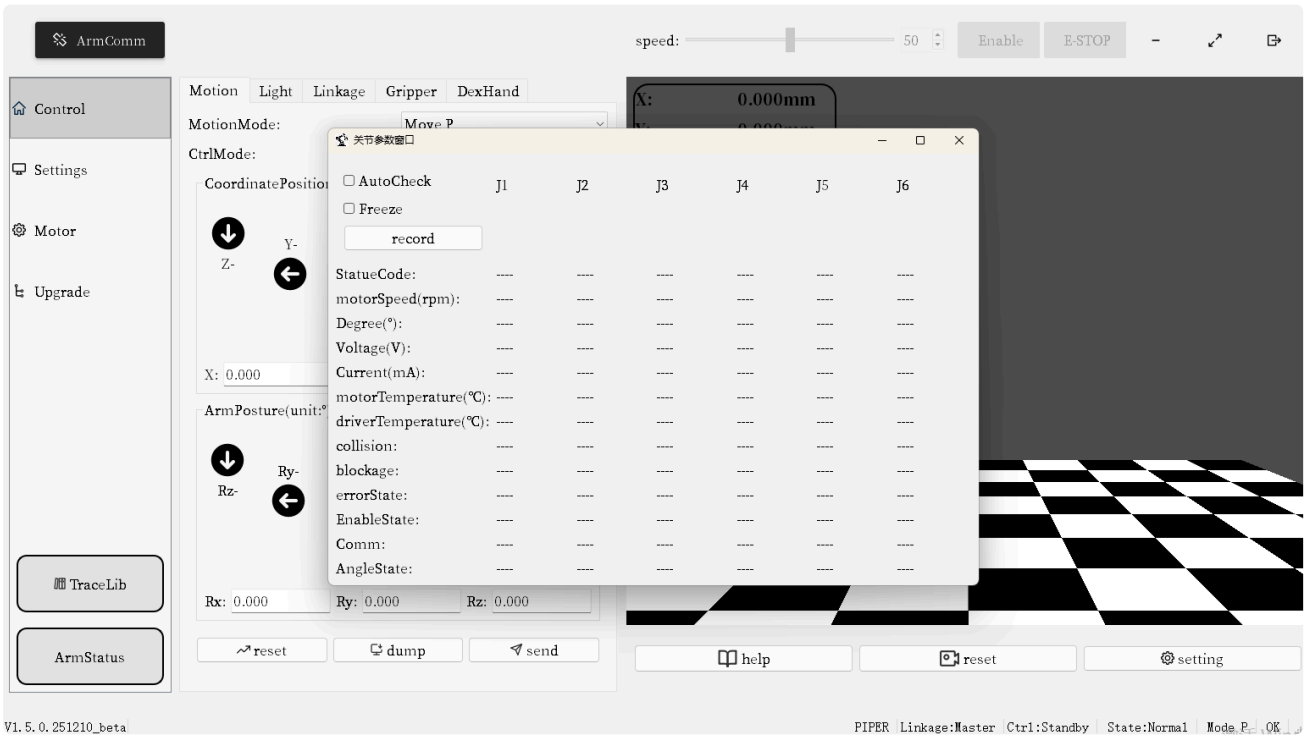


Collision Level Setting Area

4.15 Joint Information

View joint motion and status information.





4.16 Motor Settings

The figure below shows the motor settings, which can be used to set the status (enable, disable), zero position setting, and clear errors of the six joint motors of the robot arm.

Motor setting

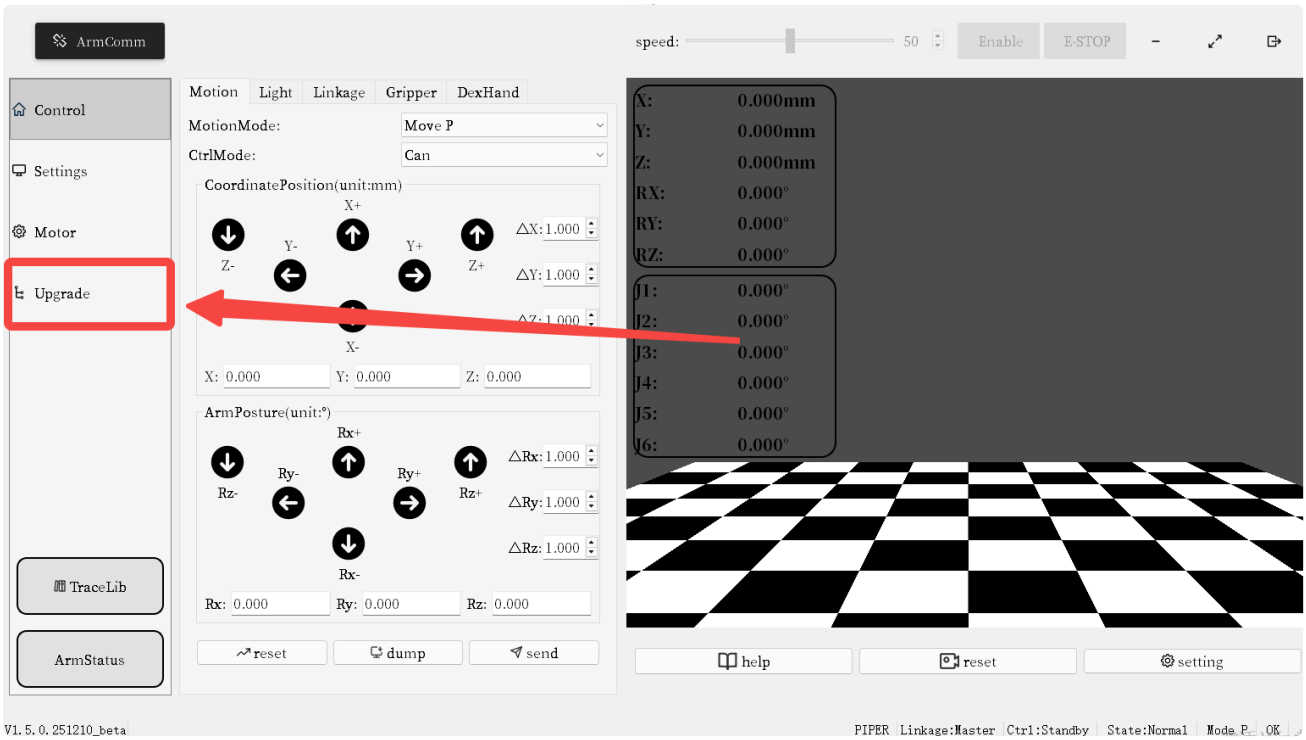
4.17 Firmware Upgrade

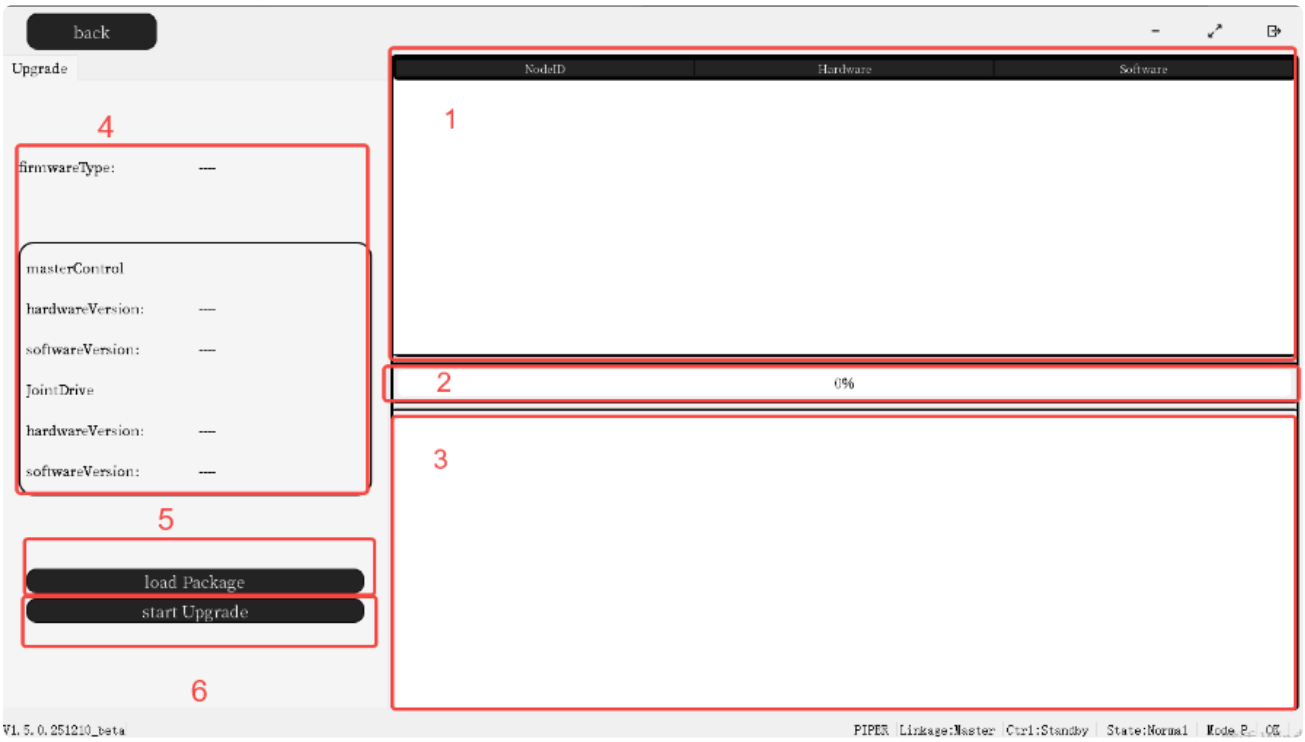
The following figure is the page related to the robot version upgrade. The upgrade steps are as follows:

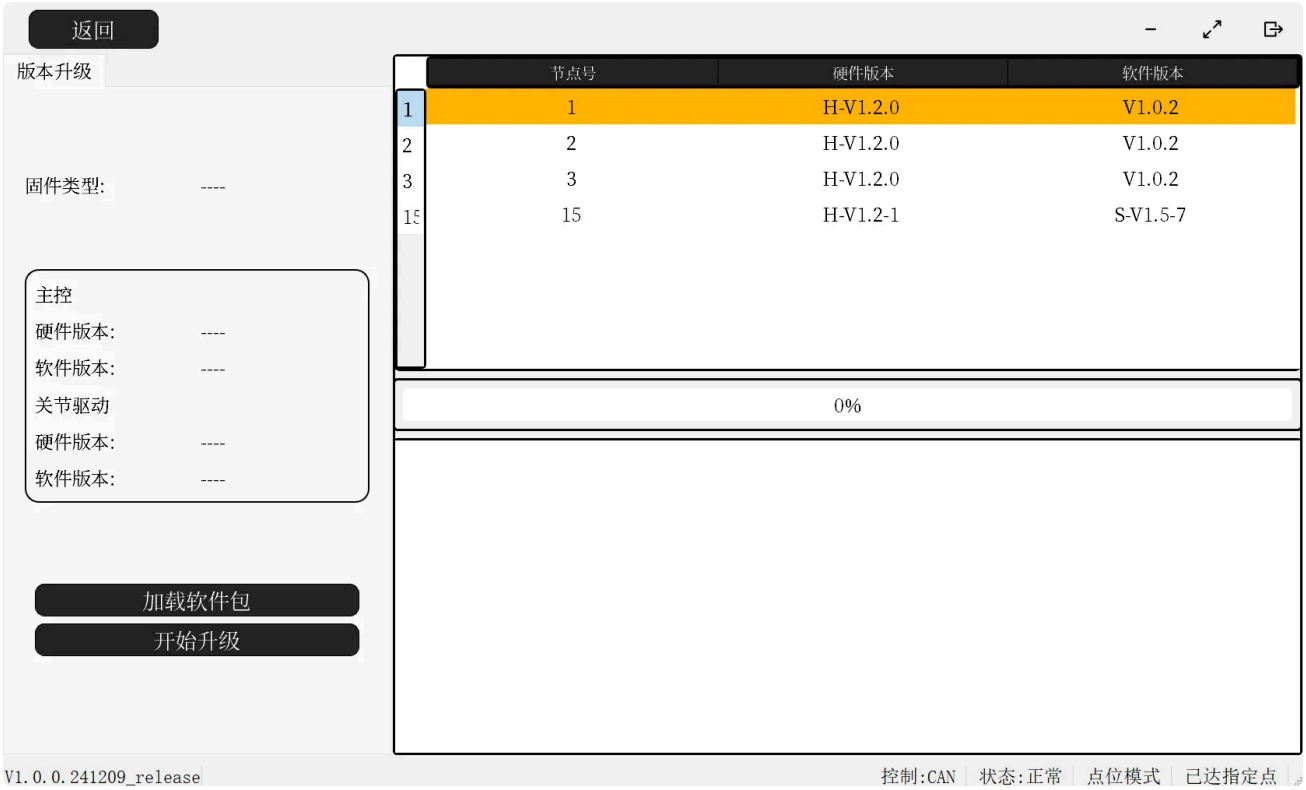
① Check whether there are words such as node information generated in the information display area (area 1). If there are words, it means that the robot has entered the upgrade state normally. If the check is correct, it can be upgraded normally;

② Click the [Load Package] button (area 5), select the version firmware configured by R&D (suffixed with bin), and after confirmation, the information area (area 4) will display the firmware package information selected by the user;

③ Click the [Start Upgrade] button (area 6) and wait for the progress bar (area 2) to complete. The normal time is about 2~3 minutes.



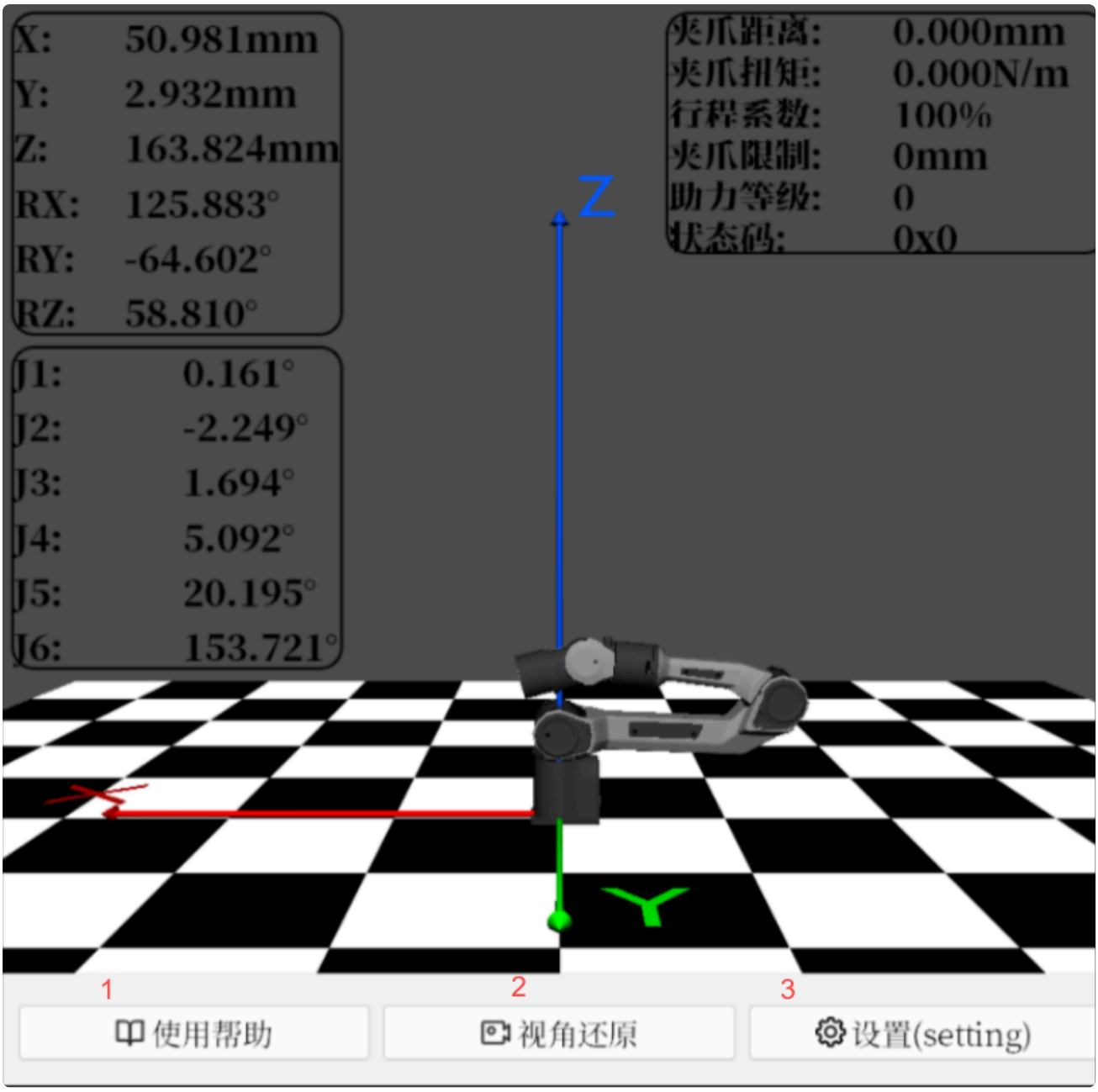




Upgrade area

4.18 3D Simulation Model

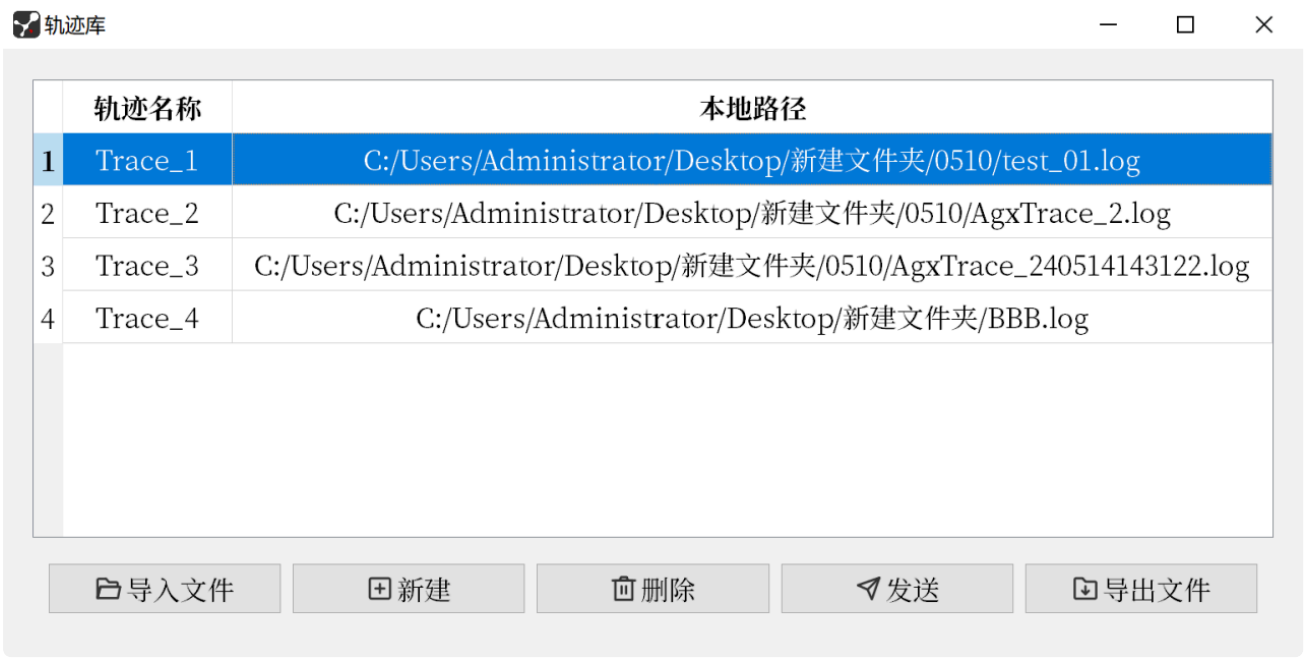
On the right side of the window is the real-time 3D simulation model of the robot arm. The upper left corner shows the real-time feedback coordinate values and 6 joint degrees of the current robot arm. The three buttons below are ① Help, ② View Restore, and ③ Settings. Button ①: Pop-up window displays the usage of the 3D area, button ②: Restore the original 3D display view, and button ③: Set various parameters of the host computer. The specific content is subject to actual experience.



3D simulation model

4.19 Trajectory Library

Click the [TraceLib] below the vertical menu bar, and a pop-up window will appear. Users can customize and edit a complete robot arm motion trajectory and run it.



Trajectory Library Pop-up

① Import: Import the local trajectory library log file.

② Create: Create a new motion trajectory.

③ Delete: Delete the selected trajectory.

④ Send: Send the selected trajectory to make the robot arm run the trajectory once, multiple times, or in a cycle.

⑤ Export file: Export the selected trajectory to the local.

At the same time, the user can double-click any trajectory to enter the secondary menu, edit the specific content of the trajectory (as shown below), and right-click to add, delete, modify, and check.

TraceLib secondary menu

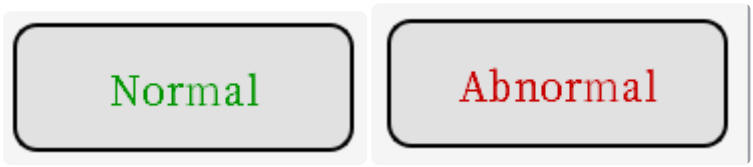
4.20 Joint Status Button

Click the robot arm joint status button at the bottom left of the window, and a [Joint Status] window will pop up (as shown below), which will monitor the status information of the 6 joints in real time. The button will monitor and display the current status in real time according to the status of the connected joints (as shown below).

关节参数窗口

	J1	J2	J3	J4	J5	J6
StatueCode:	0x40	0x40	0x40	0x40	0x40	0x40
motorSpeed(rpm):	-3	-38	0	17	-34	138
Degree(°):	2.258	-0.067	1.493	1.297	23.449	0
Voltage(V):	23	23	23	23	23	23
Current(mA):	49	50	9	4	4	20
motorTemperature(℃):	30	30	30	31	31	31
driverTemperature(℃):	35	34	34	35	36	36
collision:	normal	normal	normal	normal	normal	normal
blockage:	normal	normal	normal	normal	normal	normal
errorState:	normal	normal	normal	normal	normal	normal
EnableState:	Enable	Enable	Enable	Enable	Enable	Enable
Comm:	normal	normal	normal	normal	normal	normal
AngleState:	normal	normal	normal	normal	normal	normal

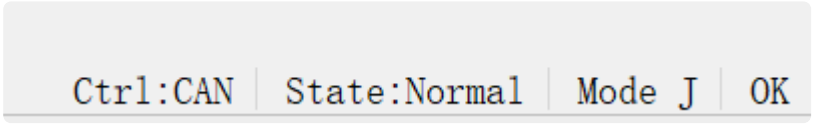
Joint status window



Joint status

4.21 Robotic Arm Status Bar

The robot arm status bar at the bottom right of the window will monitor the robot arm status information in real time (as shown below).



Robotic arm status

---

5. Secondary Development

The robotic arm supports Python SDK and ROS1/ROS2 driver packages. Links below. For detailed development, refer to GitHub.

Content	URL
SDK	https://github.com/agilexrobotics/pyA <https://github.com/agilexrobotics/py
URDF	https://github.com/agilexrobotics/pipe umble_beta1/src/robot_description/pi ption <https://github.com/agilexrobotics/pi humble_beta1/src/robot_description/p iption>
Isaac Sim	https://github.com/agilexrobotics/pipe umble_beta1/src/robot_description/US <https://github.com/agilexrobotics/pi humble_beta1/src/robot_description/U

6. Robotic Arm CAN Protocol

The robotic arm provides a CAN interface for user development. Users can control the arm via commands. CAN communication uses CAN 2.0B standard, 1000 kbps baud rate, MOTOROLA (MSB) format. For CAN protocol development, contact AgileX technical support for the CAN protocol manual.

CAN Protocol Manual: 《机械臂对外通信协议2025010》 <https://agilexsupport.yuque.com/staff-hso6mo/alxgtf/qii9wce225nvworv?singleDoc#7305>

---

7. Maintenance and Care

To maintain long-term performance, regular maintenance is required. Follow all instructions in this manual strictly. The purpose is to ensure normal operation of the robotic arm and accessories.

7.1 Storage

After use, return to zero point and power off before storage. Organize cables to avoid tangling or excessive pulling. Operating and storage environment: Temperature -20 to 50°C, Humidity 25%-85%, non-condensing.

7.2 Maintenance

Perform maintenance with the arm at zero point and powered off. After power off:

Note:

- Cleaning: Use wet wipes or damp cloth to remove dust, dirt, and oil.
- Screw check: Check for loose screws.
- Motor check: Check motors and structure for damage or deformation.
- Cable check: Check power and CAN cables for secure connection and damaged insulation.

7.3 Emergency Handling

4622字

7.3.1 Power Off

In emergencies, disconnect the aviation connector to cut power. Note: After power off, the arm will lose power and may fall. Avoid damage to the arm, surroundings, or personnel. Disconnecting is an emergency measure, not for injury prevention.

7.3.2 Emergency Stop

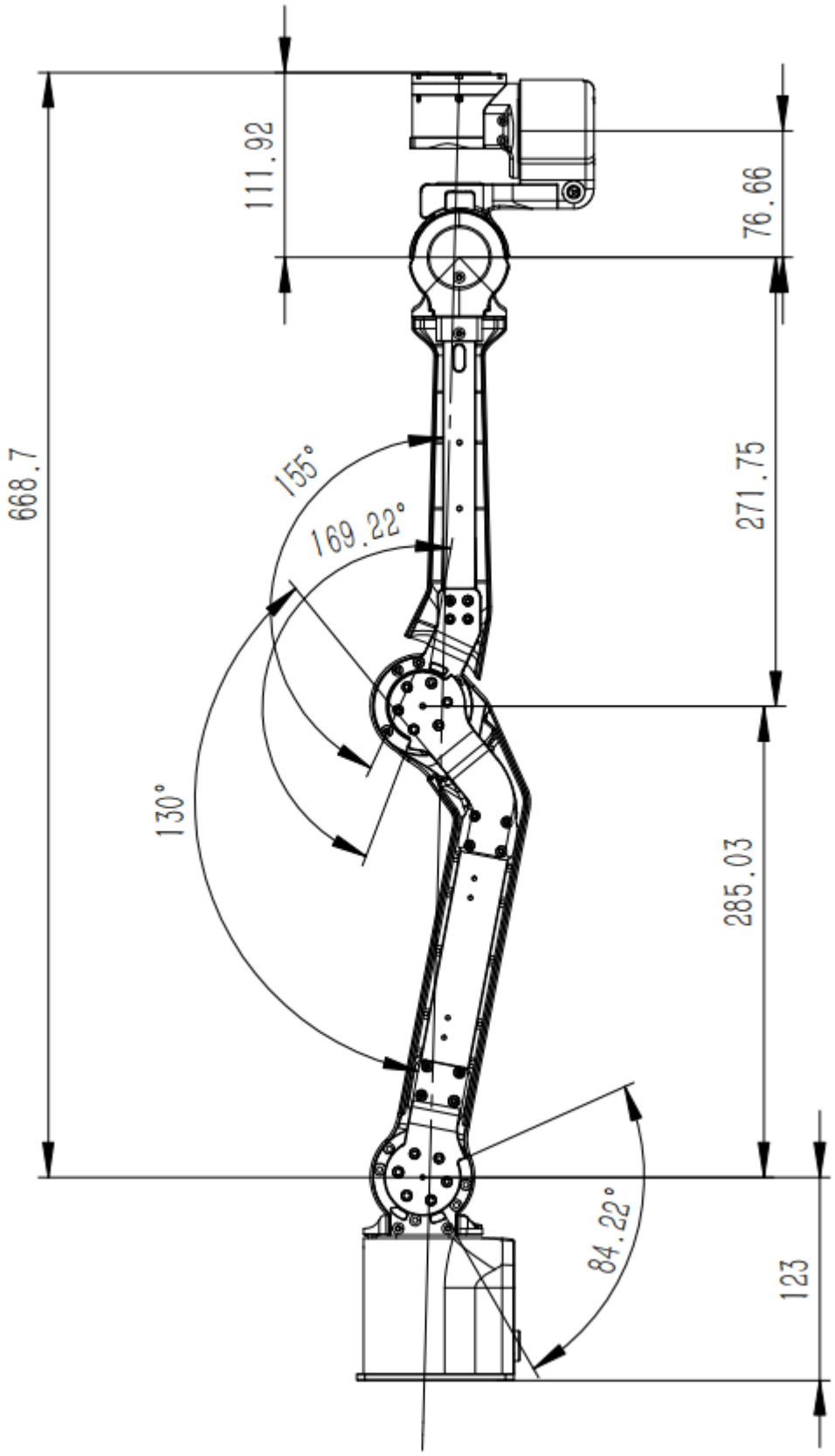
When the host is connected, use the host pause button to stop and resume arm motion.

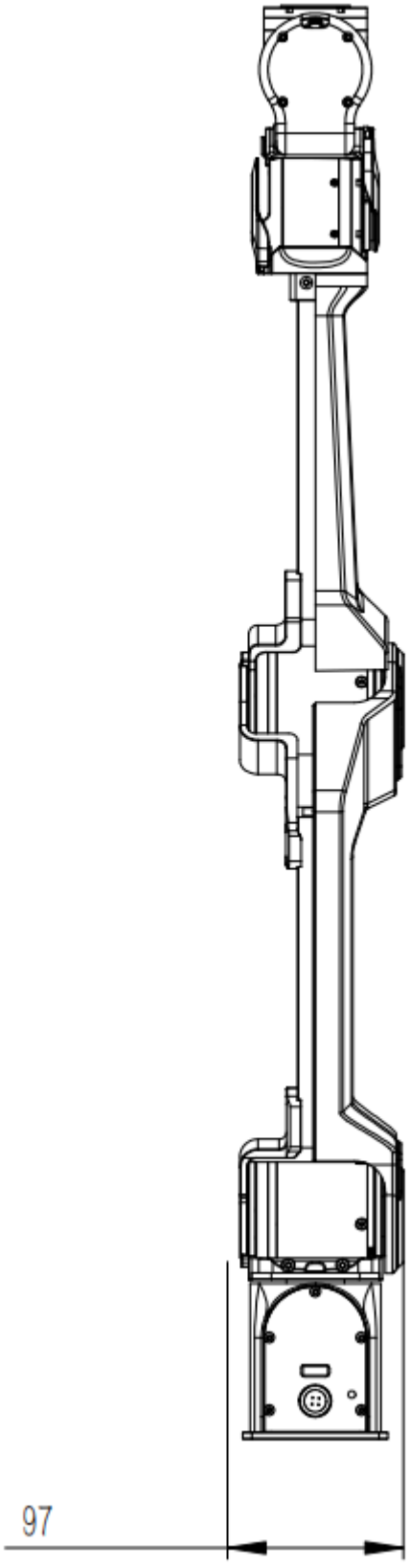
---

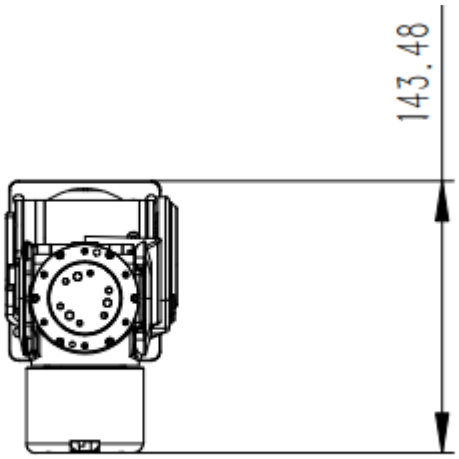
8. Dimension Drawings

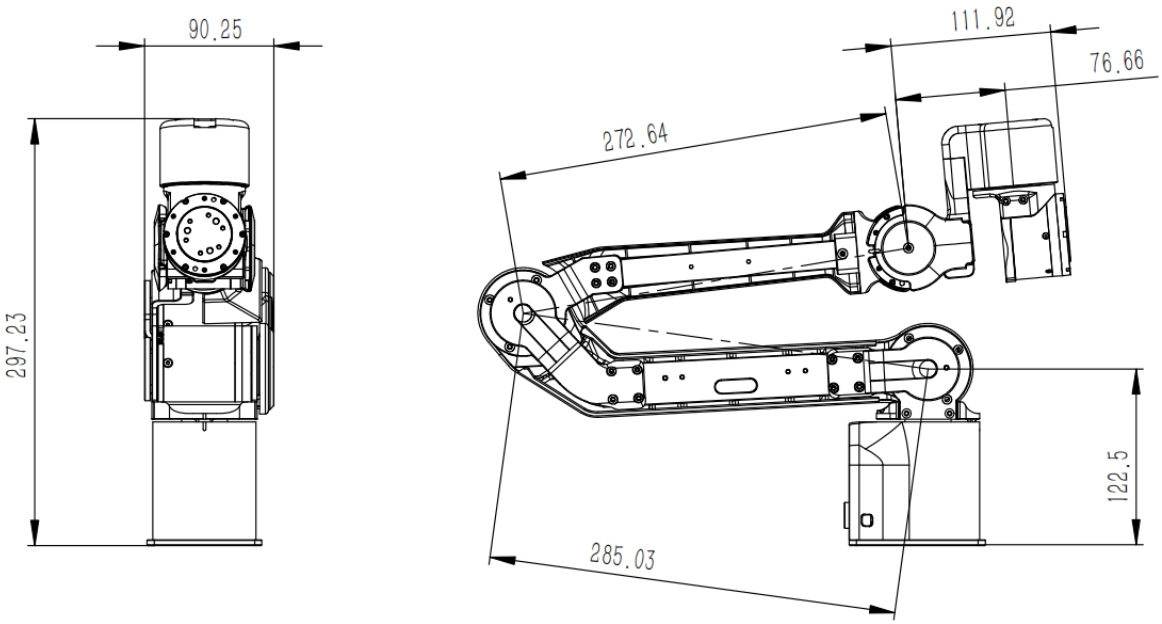
3D STEP model: 《PIPER-X 模型文件》 <https://agilexsupport.yuque.com/staff-hso6mo/alxgtf/nv0dsc0nnfgy8272?singleDoc#>

8.1 Robotic Arm Dimensions

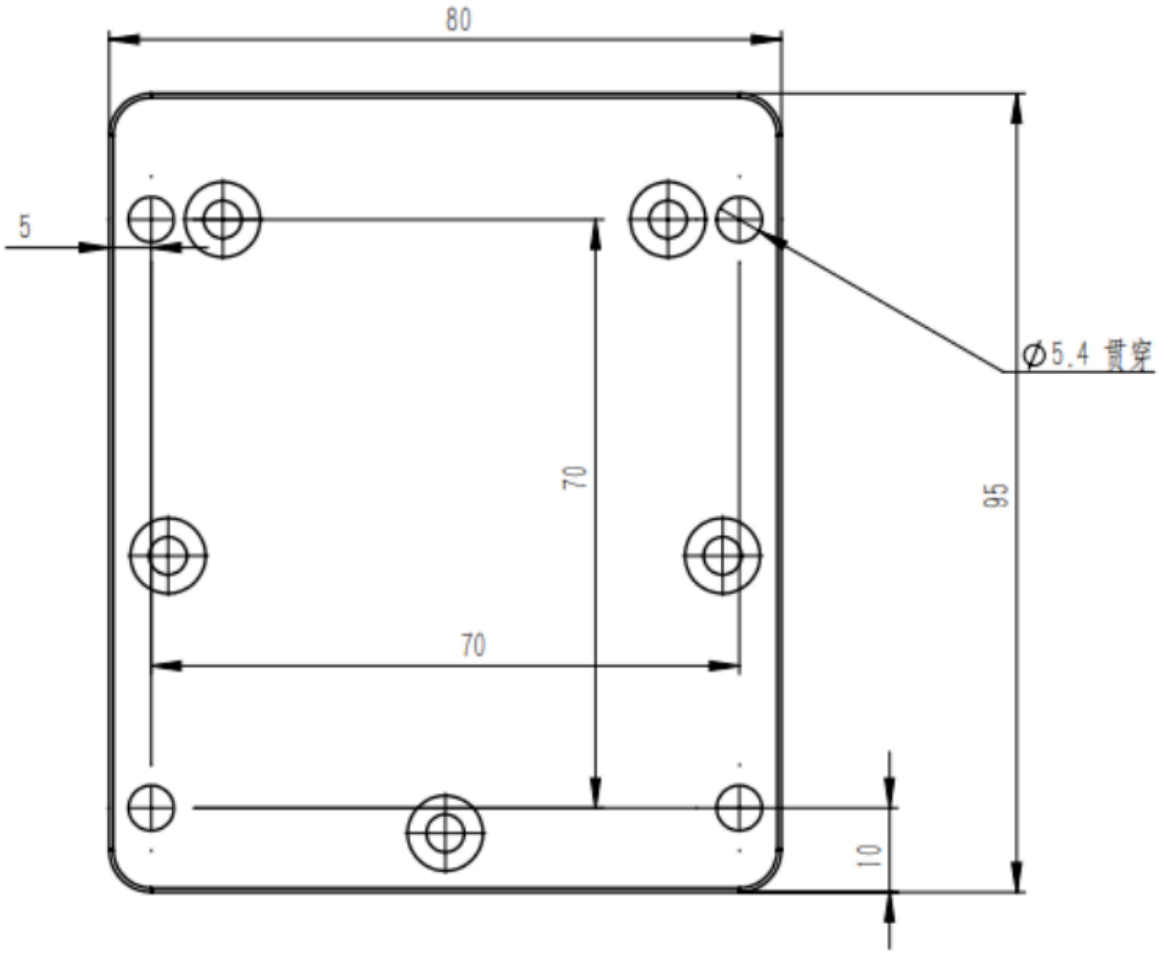

111.92
76.66
668.7
271.75
155°
169.22°
130°
285.03
84.22°
123


97

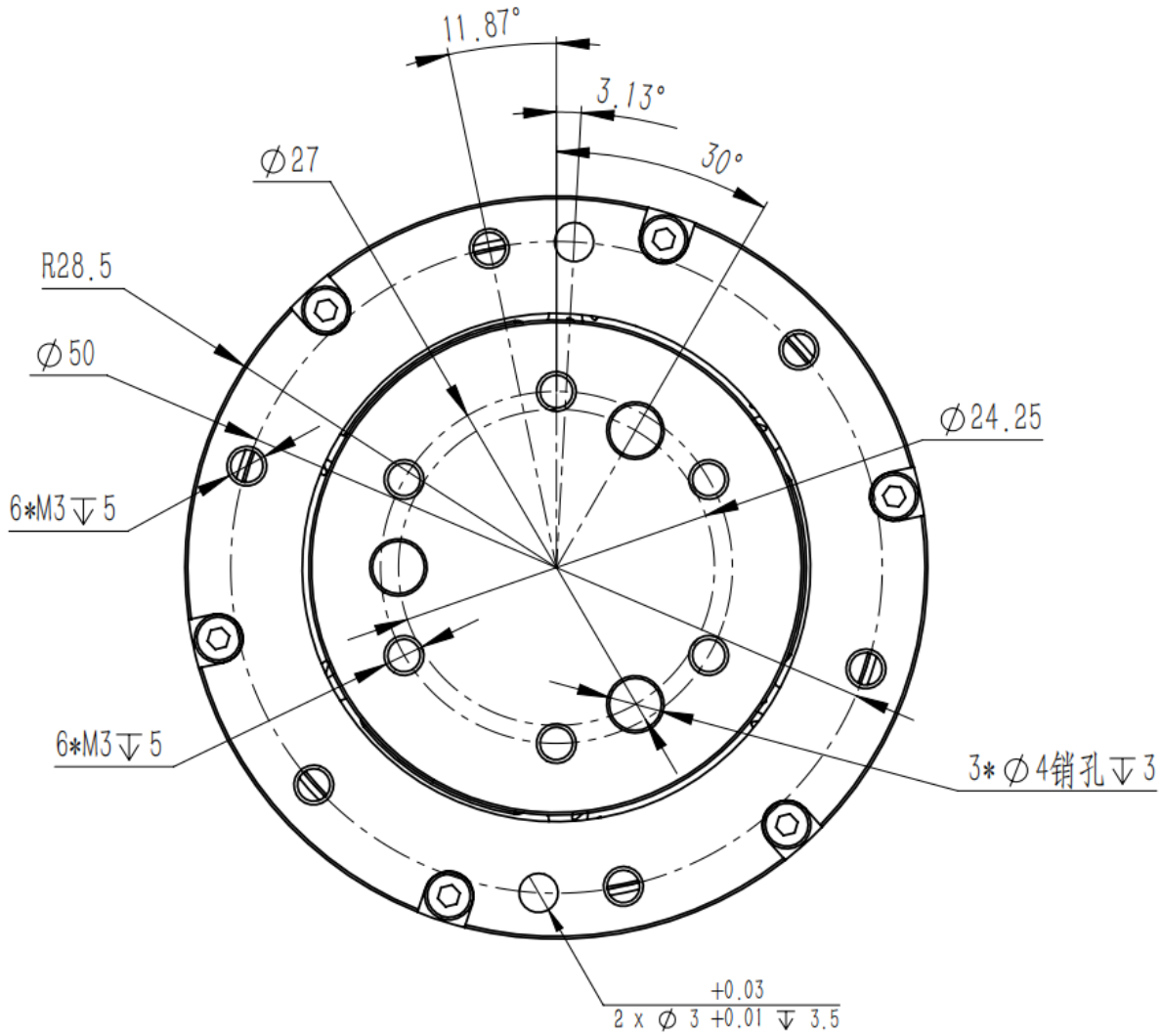




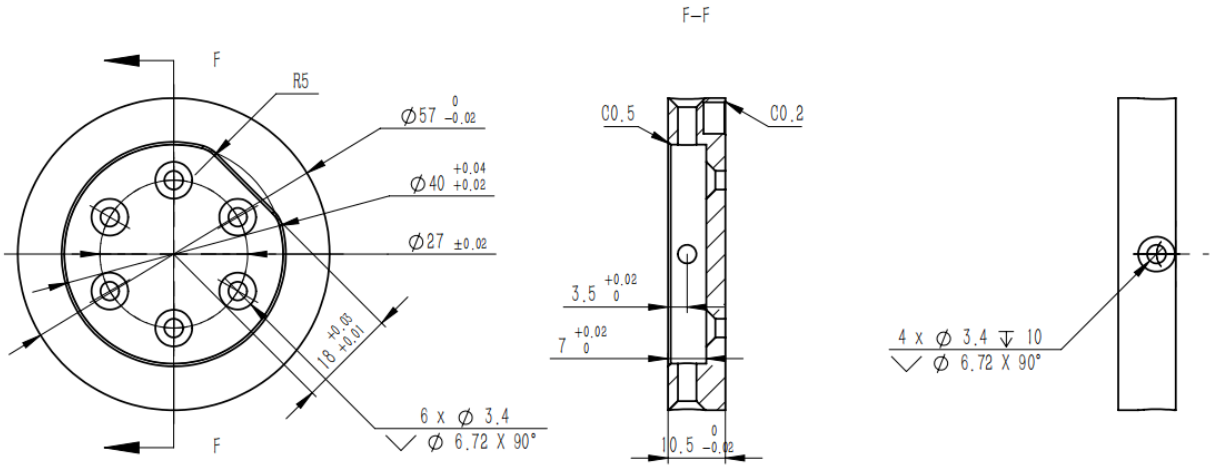
8.2 Base

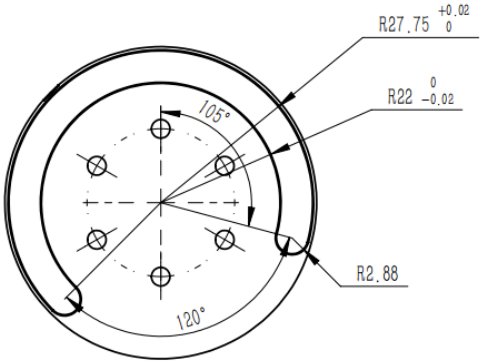


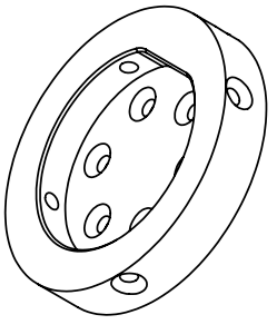
8.3 End Mounting Surface



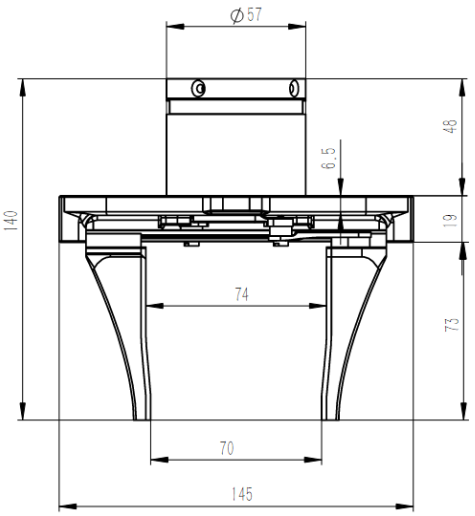
8.4 Flange Dimensions

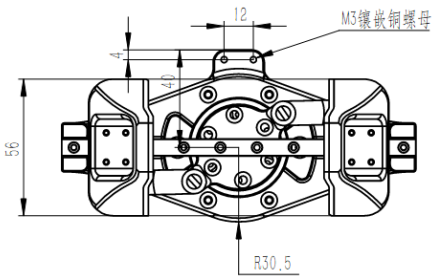


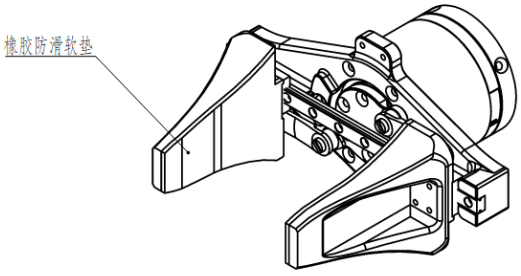




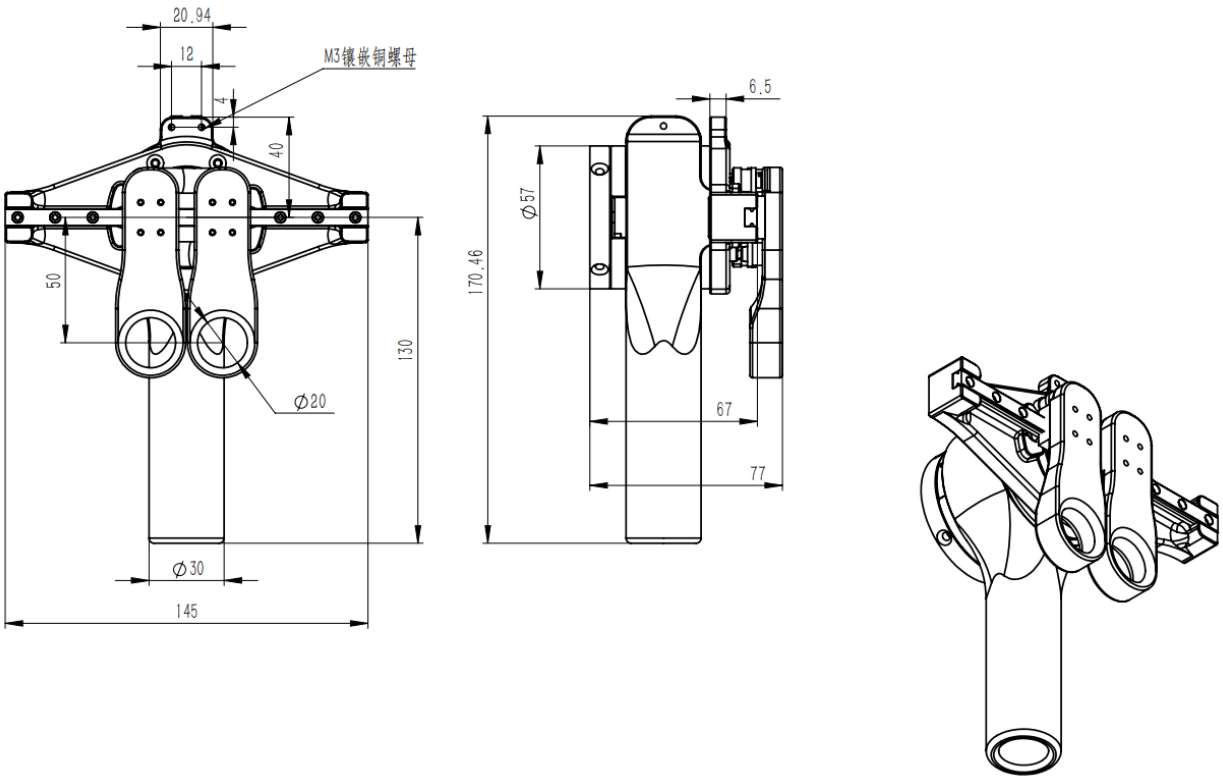
8.5 Gripper Dimensions







8.6 Teach Pendant Dimensions



8.7 G-Type Woodworking Clamp Dimensions