

# Alpha Human H1 Operation Tutorial

## 1. Power On and Start

Before starting, it is recommended to place the `Alpha Human H1` robot as shown in the figure below, keep the body level, and then turn on the power.



## 2. IP Connection

### 2.1 Connect to WIFI

After turning on the power, wait a few more minutes, then use your computer to search for and connect to the WIFI. The wireless name is `H1-2.4G-XXX`, and the password is `11111111`.

### 2.2 Log in to the Client

Open the browser, log in to the IP `http://192.168.1.1/` Password `11111111`. Client Account: `admin`, Password: `admin`.

### 2.3 View IP Address

If it is the router that comes with the `Alpha Human H1` whole machine, click `网络地图`, as shown in the figure below: `focal-server 192.168.1.XXX` is the `odroid` control board IP Address; `nvidia-desktop 192.168.1.XXX` is the `nvidia nano` control board IP Address.

If it is the user's own router, logging in using the IP corresponding to the user's router can also query the connected device address.

Note: For each Alpha Human H1 machine, the last few digits of the IP are different ( 192.168.1.XXX ).



### 3. Connect to the Host Computer

#### 3.1 Wireless Remote Control Version

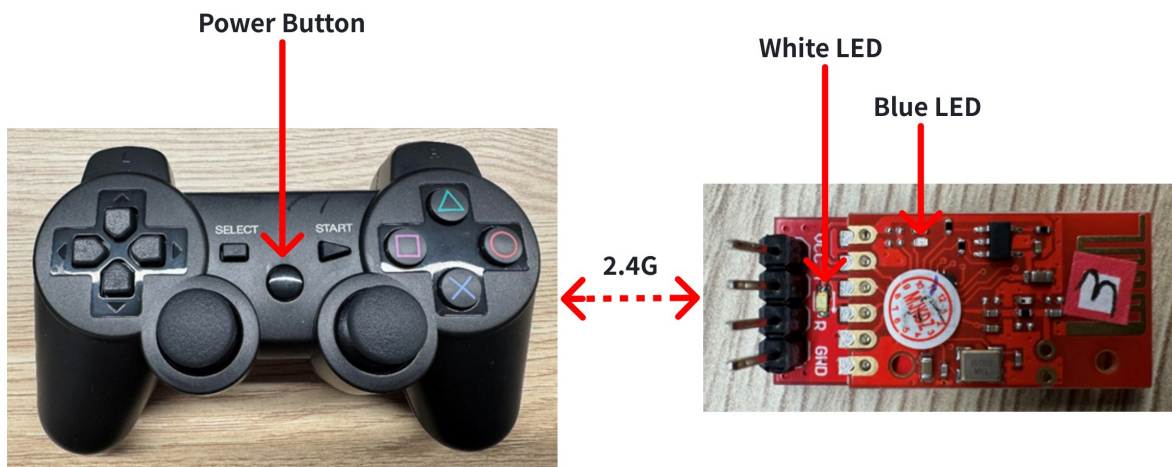
(Recommended for users who purchase the complete machine)

Turn on the robot's power, then turn on the remote control's power:

- If the white light is on and the blue light is on or flashing rapidly, it indicates a successful connection
- If the white light is on and the blue light is off or blinking slowly, it indicates a disconnection

Note:

1. Possible reasons for connection disconnection include hardware damage, low battery level of the remote control, etc.;
2. When using the wireless remote control, there is no need to connect to the host computer.



## 3.2 Wired Remote Control Version

(Recommended for users who develop on their own)

If using the wireless remote control version, this section can be ignored.

### (1) Download the host computer firmware

Download Address: [https://github.com/opensourcerobot/Alpha\\_Human\\_gym](https://github.com/opensourcerobot/Alpha_Human_gym) , located at `hardware/HMI.zip` .

Unzip the `HMI.zip` file to obtain two folders: `main_win` , `OmniBotHmi` , and place these two folders on the `D` drive of a `Windows` computer.

Note: These two files must be placed in the root directory of Drive D, without any additional folders outside.

### (2) Modify the IP Address of the host computer

Open `OmniBotHmi/ocu_param.txt` file, and modify the IP Address of `UDP_IP_Robo1` , `192.168.1.XXX` to the IP Address of the odroid

代码块

```
1  UDP_IP_Robo1, 192.168.1.70
2  UDP_IP_Robo2, 192.168.1.11
3  UDP_IP_Robo3, 192.168.1.239
4  UDP_IP_Robo4, 192.168.1.128
```

### (3) Connect the remote control to the computer

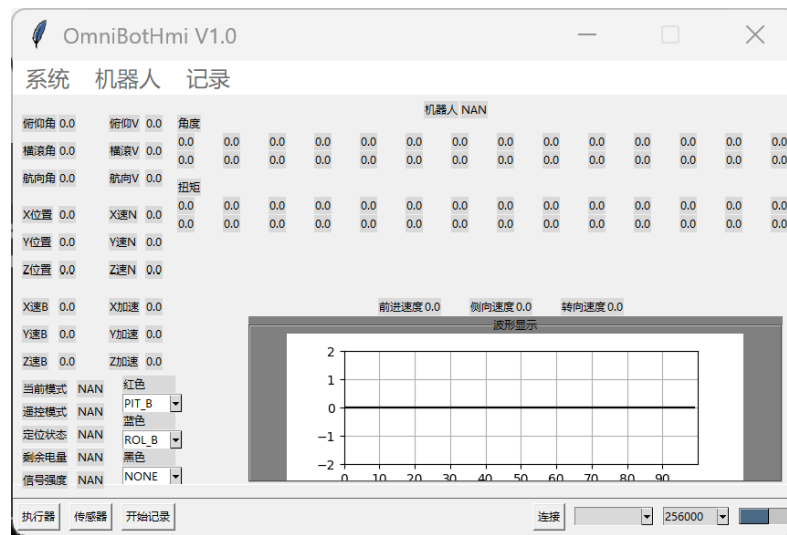
Insert the USB of the wired remote control into the USB port of the computer

Note: Before inserting the USB, it is recommended to open the Device Manager on your Windows computer and check for any other COM interfaces. If there are any redundant COM

ports, you need to delete or uninstall them, and then insert the USB of the remote control. This ensures that the computer has only one COM port, preventing read errors.

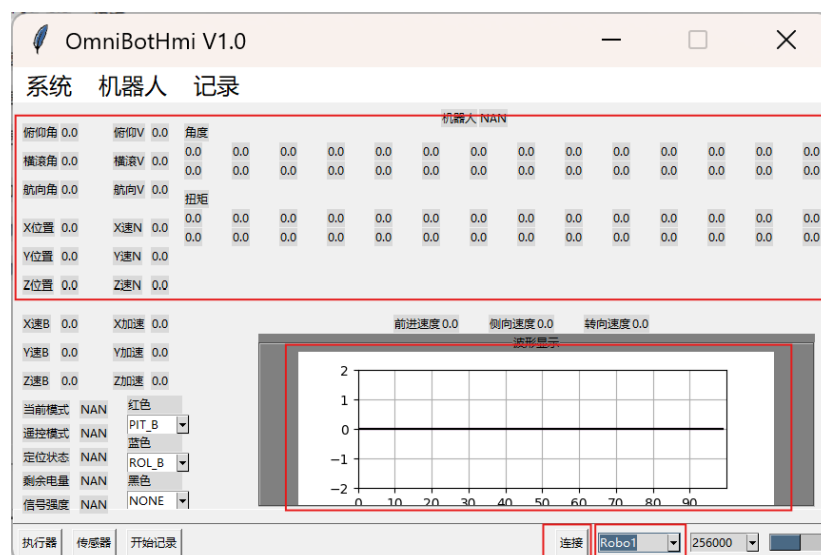
#### (4) Turn on the host computer

Open the `D:\main_win\main_win.exe` file, and the following will be displayed:



#### (5) Connect the robot

As shown in the figure below, select the address of the robot whose IP has just been modified, then click `连接`, and you will see the robot-related data displayed on the interface:



### 3.3 The remote control operates the robot

#### • Wireless Remote Control Version

**Step 1:** Long press the `□` button — the robot stands up — **(stand)**


At this time, manual assistance is needed to stand up and prevent falling; release the `□` button ;


**Step 2:** Short press the `□` button again to switch to reinforcement learning walking — **(walk)**

**This button can only be pressed after starting reinforcement learning inference**

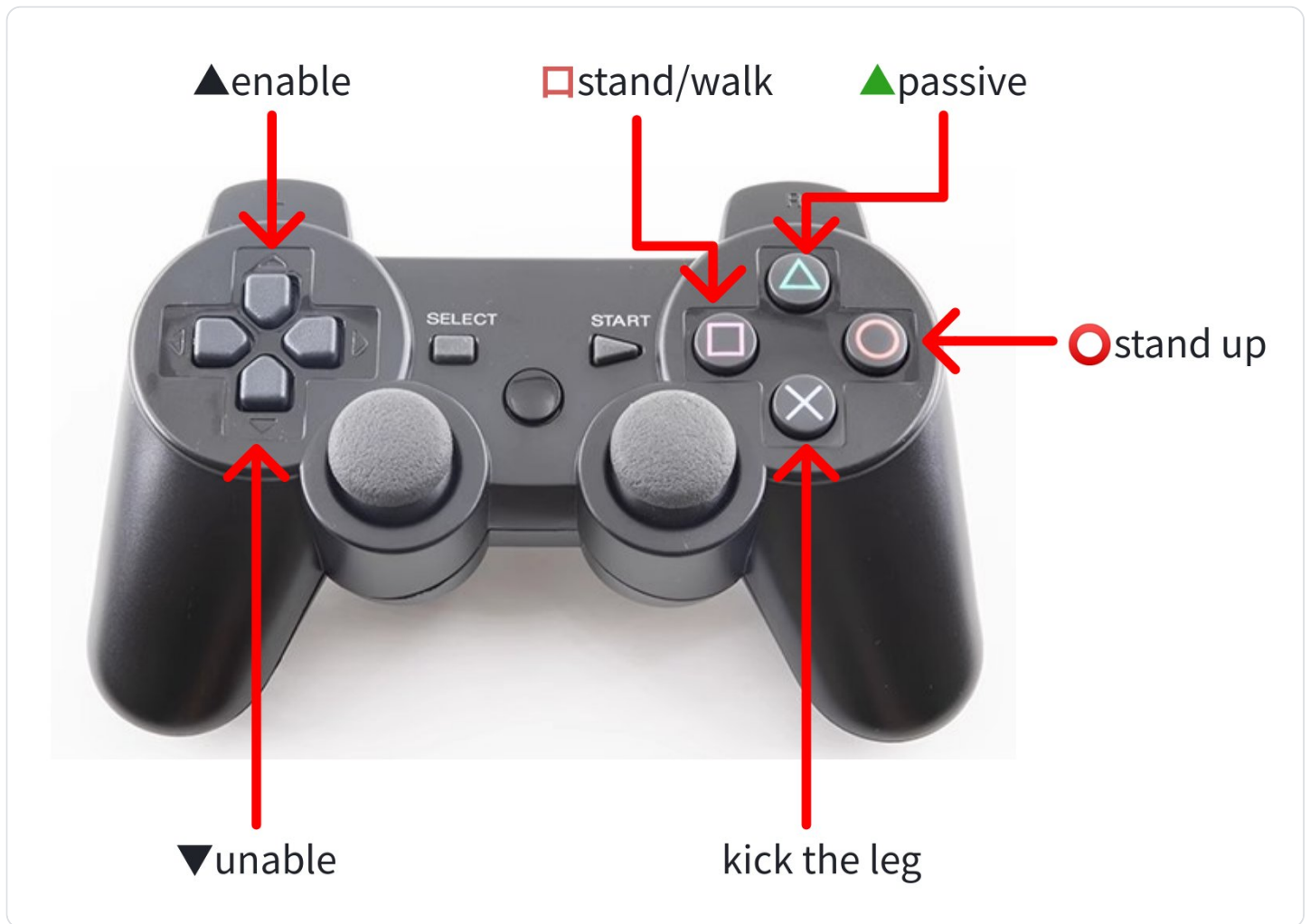
**Step 3:** The left joystick controls forward and backward movement; the right joystick controls head rotation (head motor is optional); the front buttons LT/RT control steering

**Step 4:**

Press  button to recover stand — **(recover stand)**


Press  button to stop slow descent — **(passive)**

In case of emergency, press the left  button to unable — **(unable)**



- **Remote control version**

**Step 1:** Long press the  button — the robot stands up — **(stand)**

At this time, manual assistance is needed to stand up to prevent falling; release the  button;

**Step 2:** Short press again the  button to switch to reinforcement learning walking — **(walk)**

**This button can only be pressed after starting reinforcement learning inference**

**Step 3:** Left joystick controls forward and backward; right joystick controls head rotation; front buttons LT/RT control steering

**Step 4:**

Press the  button to recover stand — **(recover stand)**



Press the **Y** button to slow down and stop — **(passive)**

In case of emergency, press the left **▼** button to enable — **(unable)**



## 4. Calibrate the robot

### 4.1 Motor Calibration

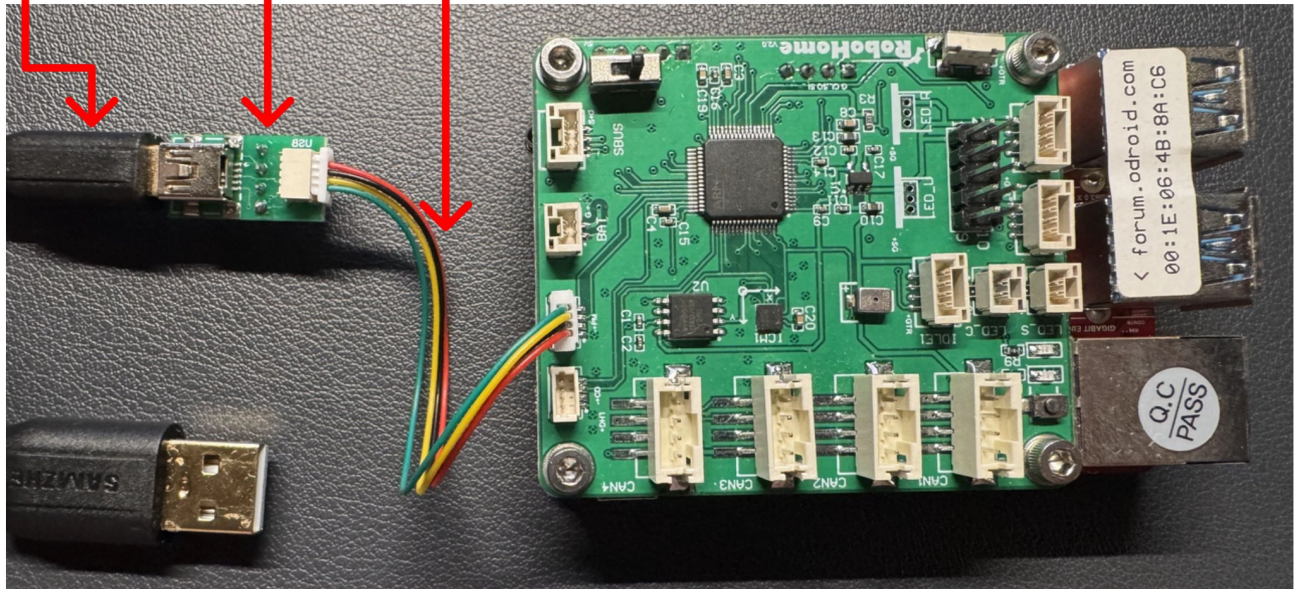
#### Description:

For whole machine users, calibration has been completed at the factory. If not specifically required, this calibration step can be omitted. Subsequently, during use, calibration should be performed if the motor zero position changes.

For self-developed users, it is necessary to complete calibration before operating the robot.

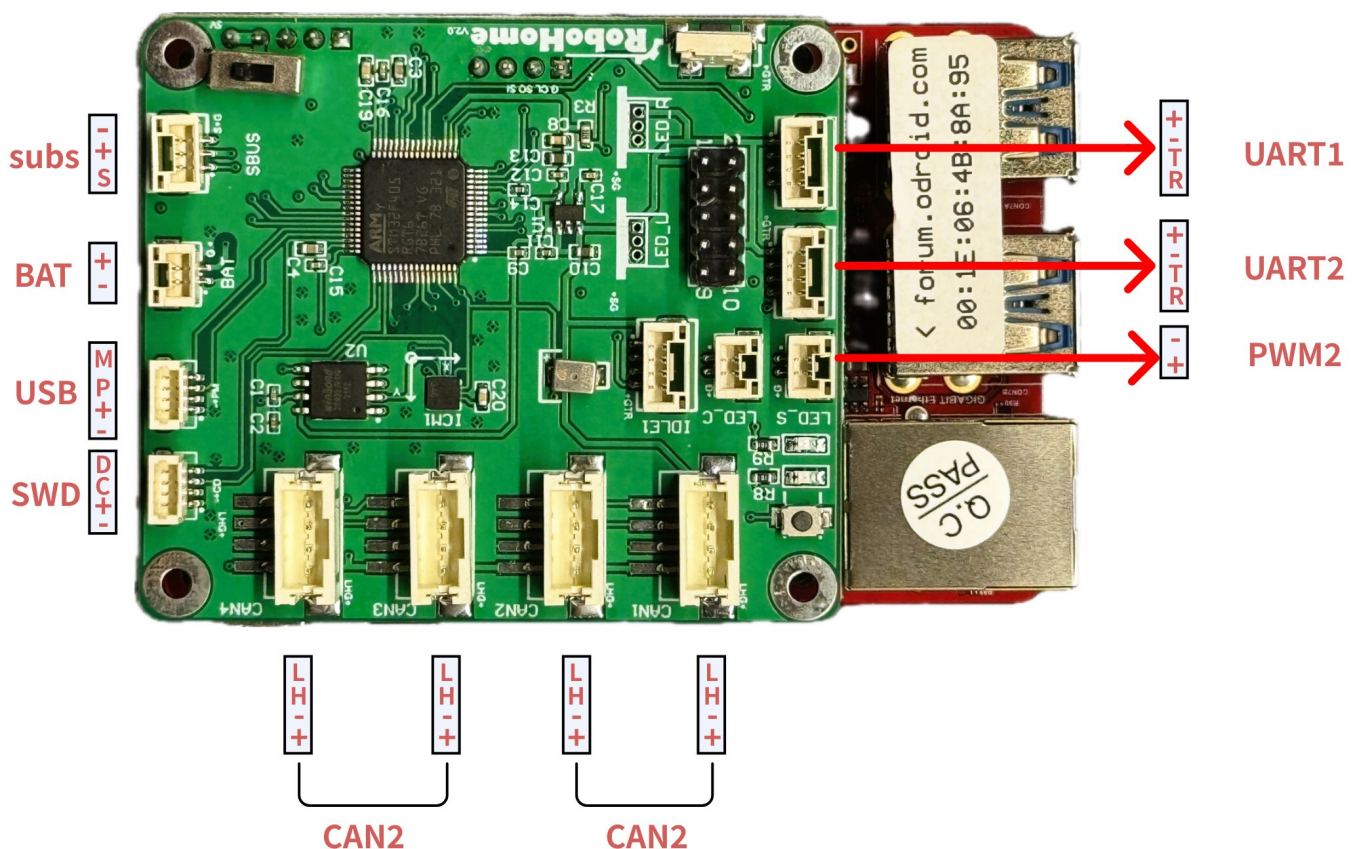
- **Required materials:** 4p wire harness + USB adapter board + Mini USB data cable

Mini USB      USB adapter board      4P wiring harness



Note: The USB adapter board only provides bridging for the 4P port of the STM32 board. If there is no adapter board, users can directly connect the four wires of the mini USB to the USB interface of the STM32. Refer to the following USB pinout diagram for the specific order.

The pinout diagram of the control board is as follows:

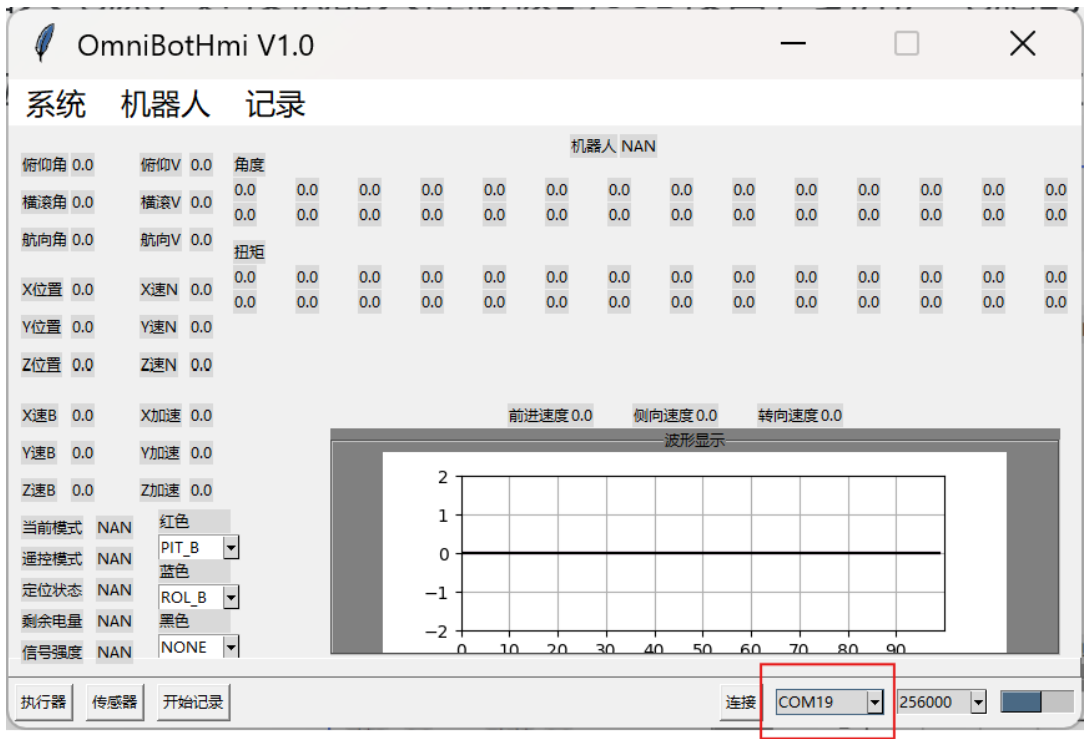


- Calibration Steps

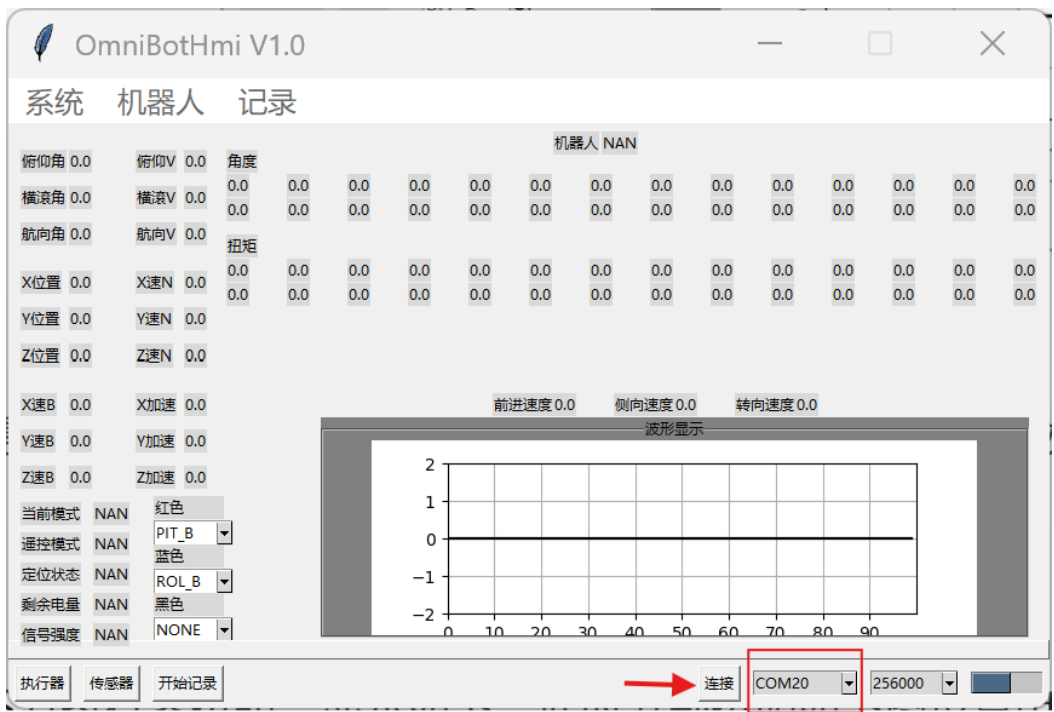
Step 1:

Turn on the robot's power supply, and connect the USB interface of the robot control board to the USB interface of the user's computer.

Open the host computer , check if the host computer detects the COM port. If detected, the host computer will display COM, as shown in the figure below:

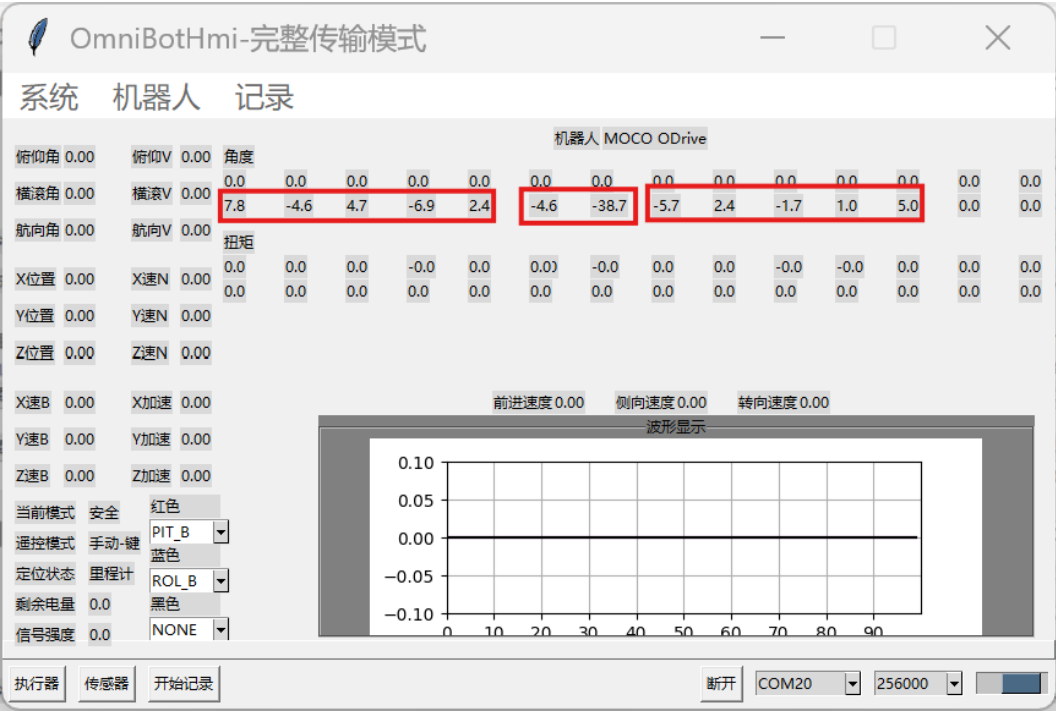


At this point, you need to unplug the USB and plug it in again, and you will see that the COM port of the host computer has changed.



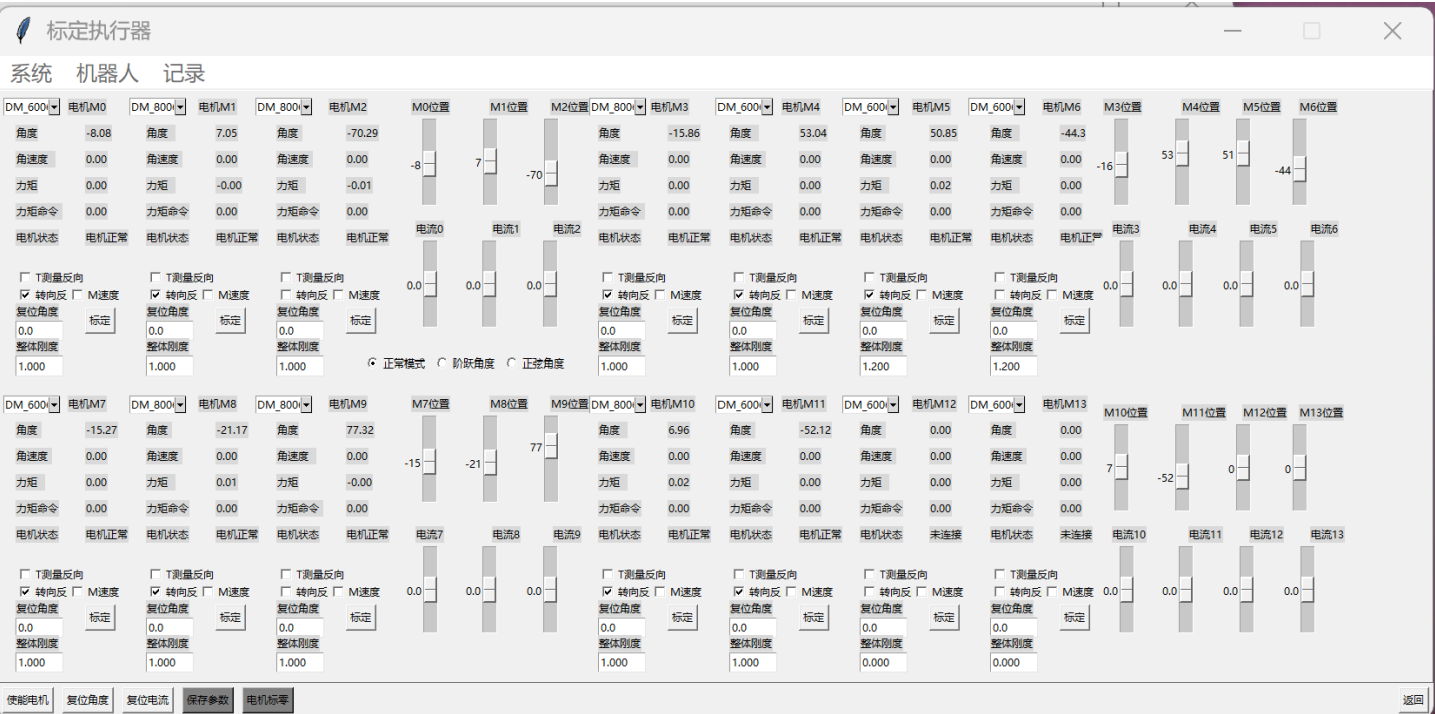


Then click **连接** , connect to the control panel, and you can see the data of 10 motors on the left and right legs and the data of two motors on the head



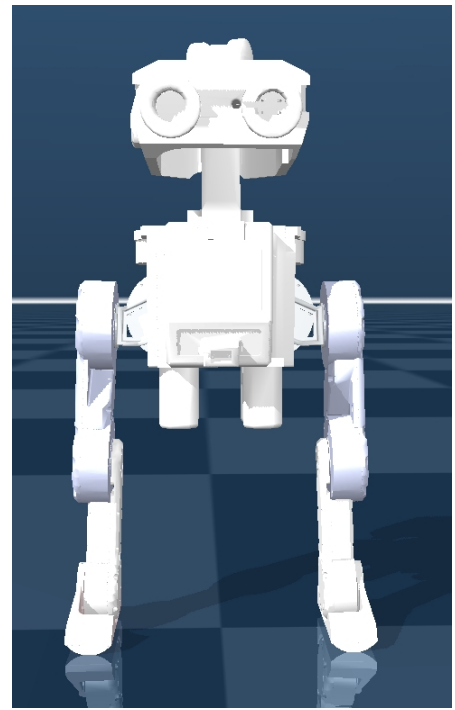
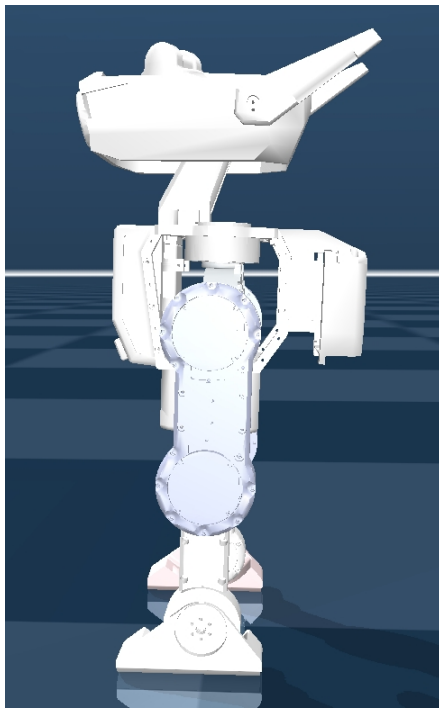
Step 2:

Click the **执行器** button in the lower left corner, and the following will be displayed. At this time, set the motor parameters respectively as shown in the following figure



Step 3:

Place 10 motors in the zero position one by one, and click the corresponding **标定** button to calibrate the motors individually. The zero positions of the 10 motors are shown in the figure below:



After calibration is completed, the motor **保存参数** button saves the zero position to the controller.

If two motors are installed on the head to create a 12 degree of freedom H1, the position of the head during calibration will also be as shown in the above figure.

## 4.2 IMU Calibration

- Place the fuselage horizontally
- After connecting to the host computer, click **传感器** button
- On the new interface, click **标定加速度计**, **标定陀螺仪** respectively, wait 2-3 seconds for calibration to complete, then click **返回**
- On the host computer, **俯仰角、横滚角** are close to 0, indicating that calibration is complete.

