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ZHAOWEI

Stock Code
003021



ZWHAND
Dexterous Hand



User Interaction Guide

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(2) Detailed Functional Descriptions

1. APP Files

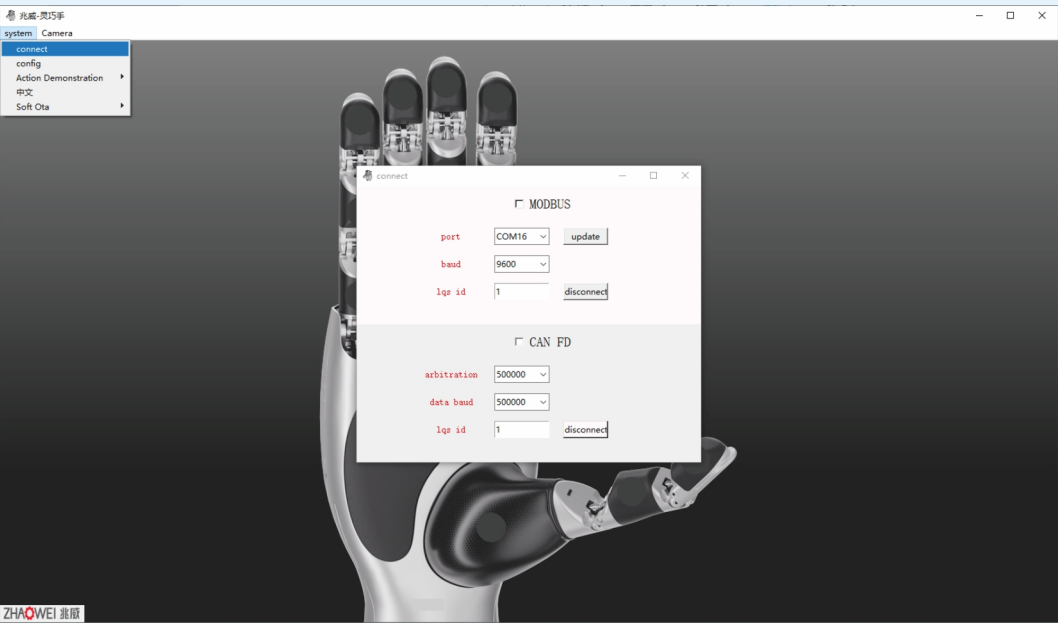
名称	修改日期	类型
kernelDlls	2025/7/10 11:44	文件夹
lib	2025/7/10 11:44	文件夹
share	2025/7/10 11:44	文件夹
zwHand	2025/7/10 11:44	文件夹
frozen_application_license.txt	2025/5/21 9:42	文本文档
17DOF_灵巧手人机交互.exe	2025/7/10 11:44	应用程序
concrct140.dll	2025/4/13 21:33	应用程序扩展
msvcp140.dll	2025/4/13 21:33	应用程序扩展
msvcp140_1.dll	2025/4/13 21:33	应用程序扩展
msvcp140_2.dll	2025/4/13 21:33	应用程序扩展
msvcp140_atomic_wait.dll	2025/4/13 21:33	应用程序扩展
msvcp140_codecvt_ids.dll	2025/4/13 21:33	应用程序扩展
python3.dll	2023/4/5 0:04	应用程序扩展
python311.dll	2023/4/5 0:04	应用程序扩展
vcamp140.dll	2025/4/13 21:33	应用程序扩展
vccorlib140.dll	2025/4/13 21:33	应用程序扩展
vcomp140.dll	2025/4/13 21:33	应用程序扩展
vcruntime140.dll	2025/4/13 21:33	应用程序扩展
vcruntime140_1.dll	2025/4/13 21:33	应用程序扩展
vcruntime140_threads.dll	2025/4/13 21:33	应用程序扩展
zlgcan.dll	2024/4/23 9:47	应用程序扩展

2. Menu Function Descriptions

(1) ZWHAND Connection and Disconnection

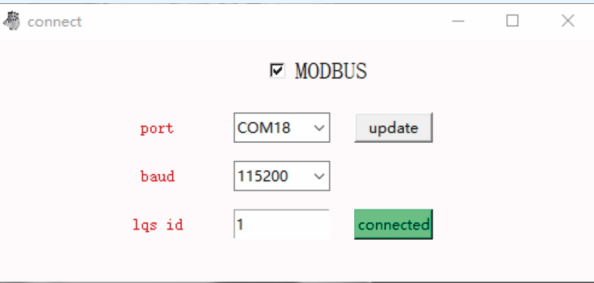
① Location of the Function

Located under the System menu upon the left corner, select the Connect.



② Connection Procedure

- Step 1:** Select the appropriate communication protocol — MODBUS or CANFD.
- Step 2:** For MODBUS, select the correct COM port, baud rate, and Device ID. For CANFD, select the correct arbitration baud rate, data baud rate, and Device ID.
- Step 3:** Click the Disconnect button to connect. To disconnect, click the button again after connection is established.



Note: When the device is first powered on, it requires a few seconds for initialization. Connection can only be established once initialization is complete.


③ ZWHAND Connection Status Display



(2) Set ZWHAND Device ID

① Location of the Function

Located under the System menu upon the left corner, select the config.

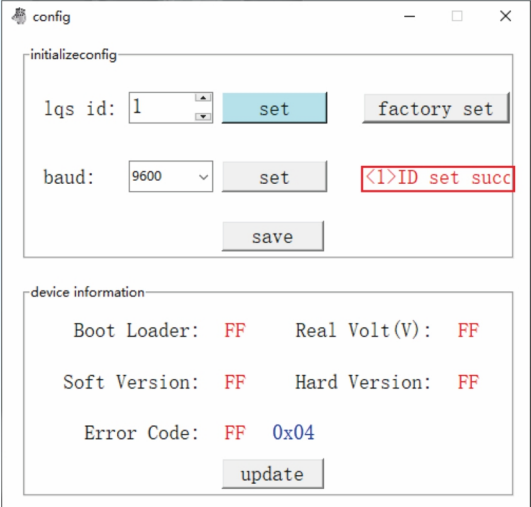


② Configuration Procedure

Step 1: Select the corresponding Device ID value (range: 0 - 255).

Step 2: Click the Set button.

③ Device ID Set Success Prompt

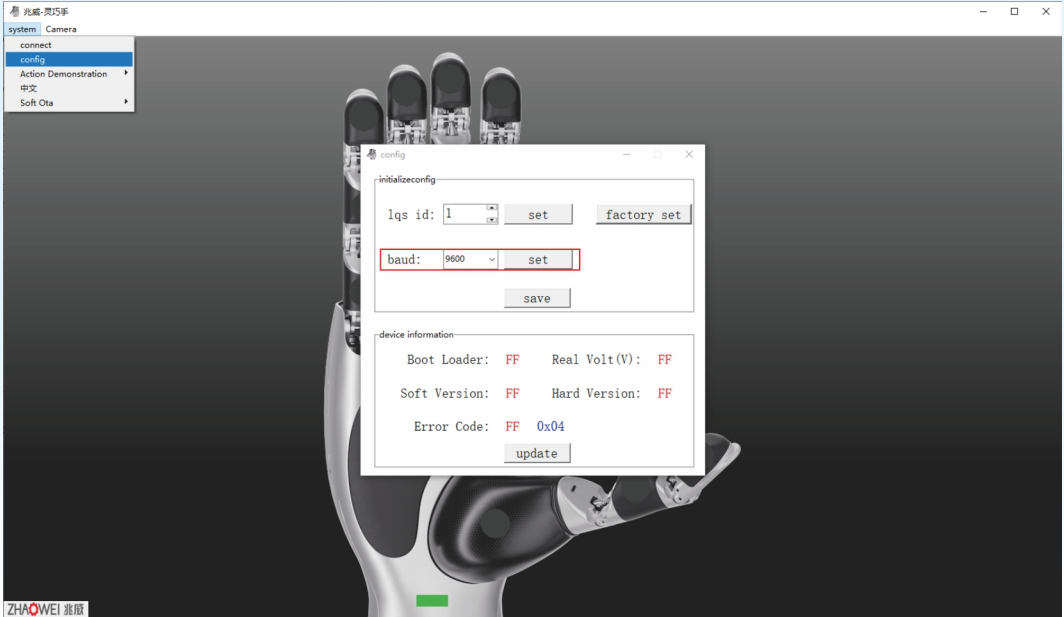


Note: Click the Save button after configuration to ensure persistence. Otherwise, the settings will be lost after power-off.

(3) Set ZWHAND Baud Rate

① Location of the Function

Located under the System menu upon the left corner, select the config.

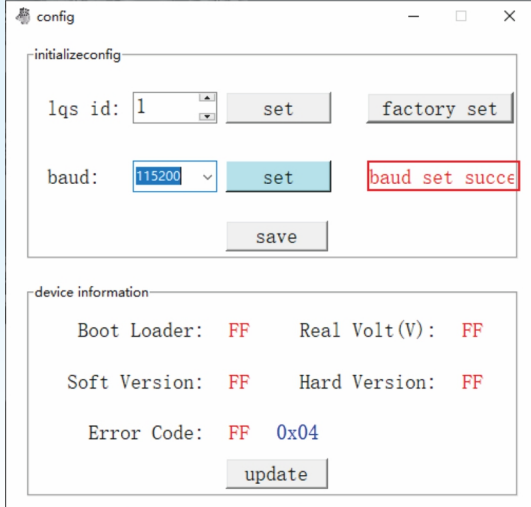


② Configuration Procedure

Step 1: Select the corresponding baud rate.

Step 2: Click the Set button.

③ Baud Rate Set Success Prompt

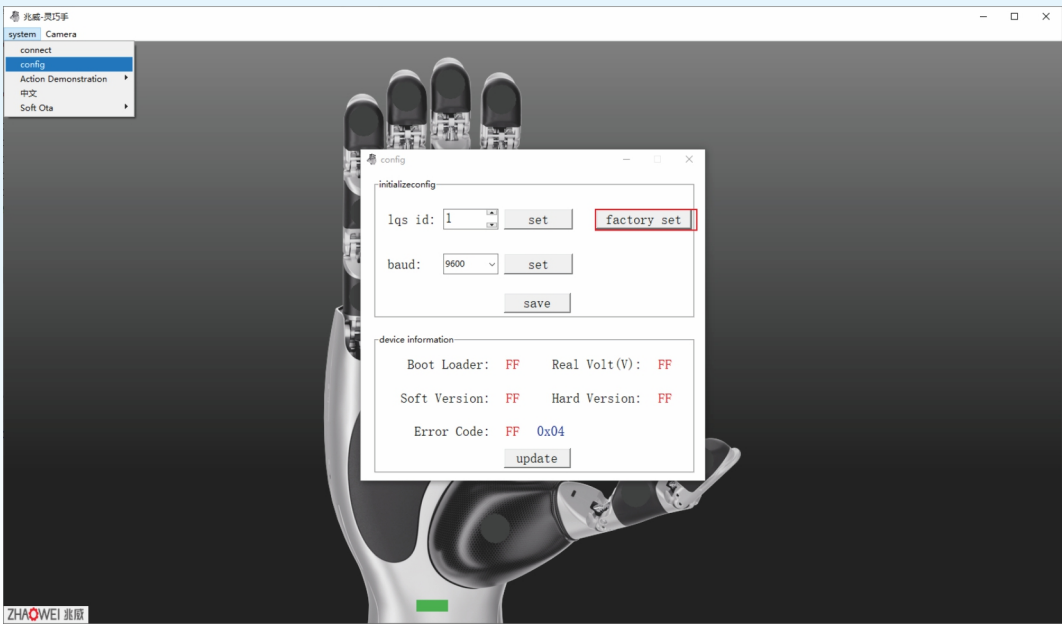


Note: Click the Save button after configuration to ensure persistence. Otherwise, the settings will be lost after power-off.

(4) Restore ZWHAND to Factory Settings

① Location of the Function

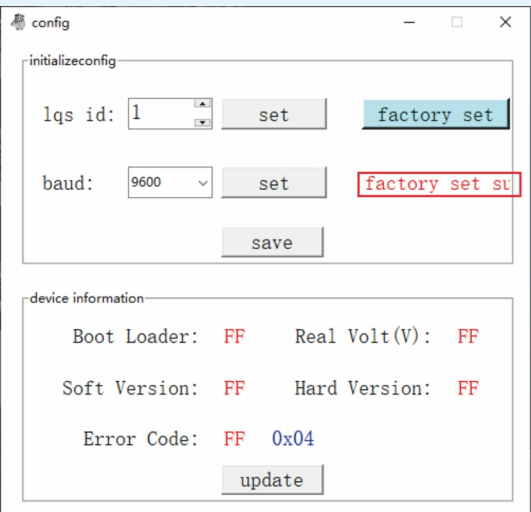
Located under the System menu upon the left corner, select the config.



② Operation Procedure

Click the Factory Set button.

③ Restore Factory Settings Success Prompt

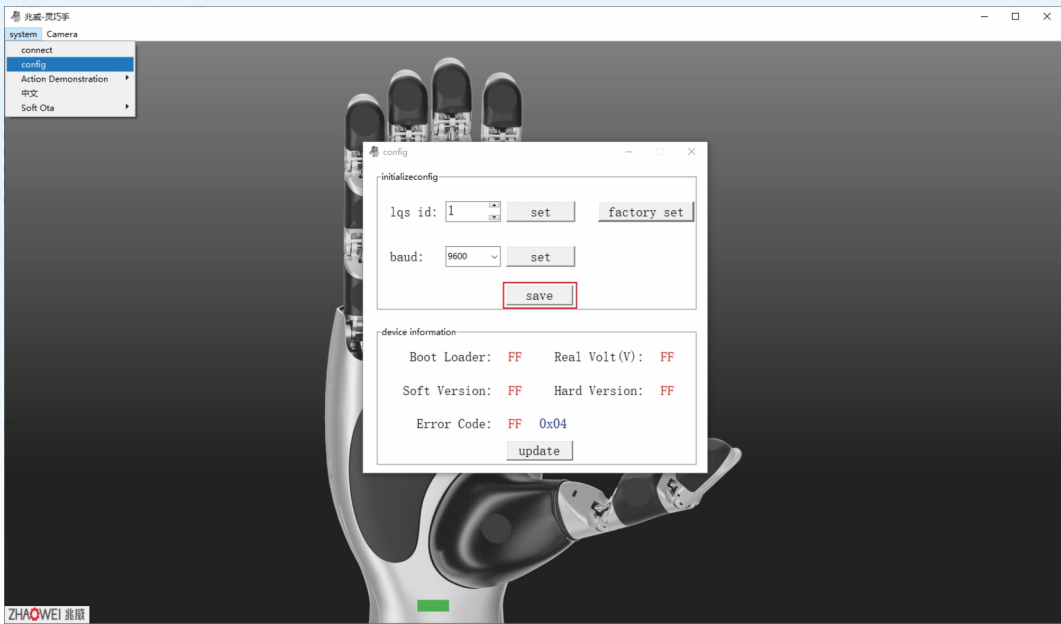


Note: Click the Save button after configuration to ensure persistence. Otherwise, the settings will be lost after power-off.

(5) ZWHAND Power-Off-Save-Data Configuration

① Location of the Function

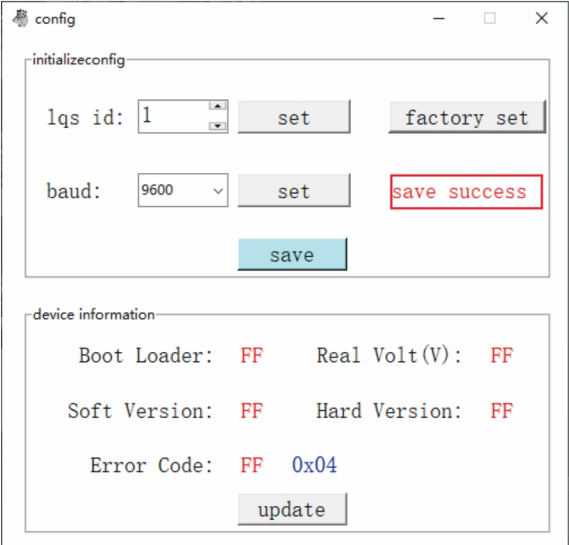
Located under the System menu upon the left corner, select the config.



② Operation Procedure

Click the Save button.

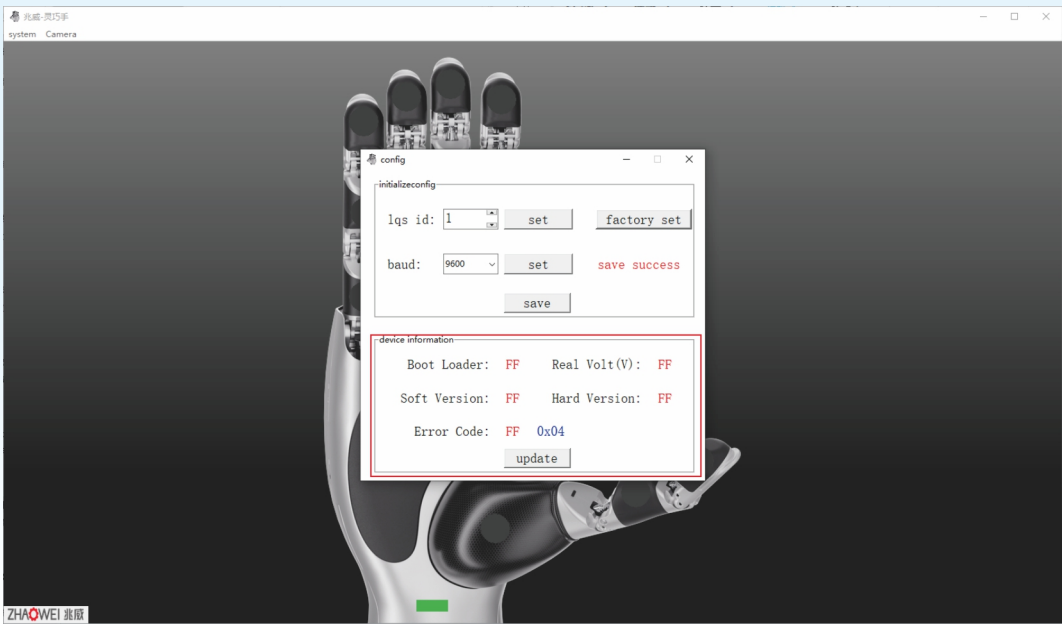
③ Save Success Prompt



(6) Update ZWHAND Device Information

① Location of the Function

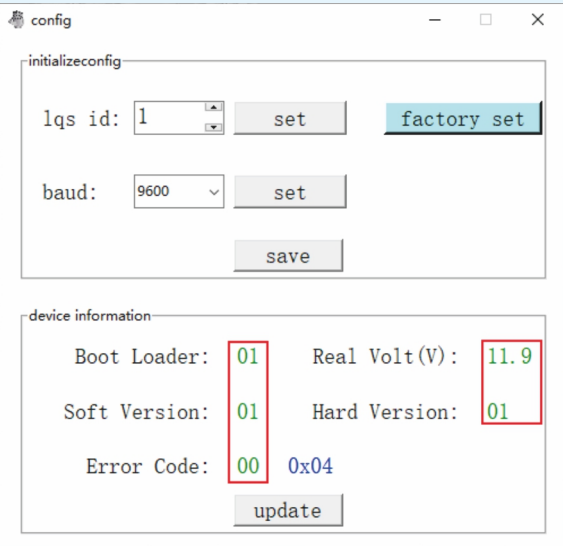
Located under the System menu upon the left corner, select the config.



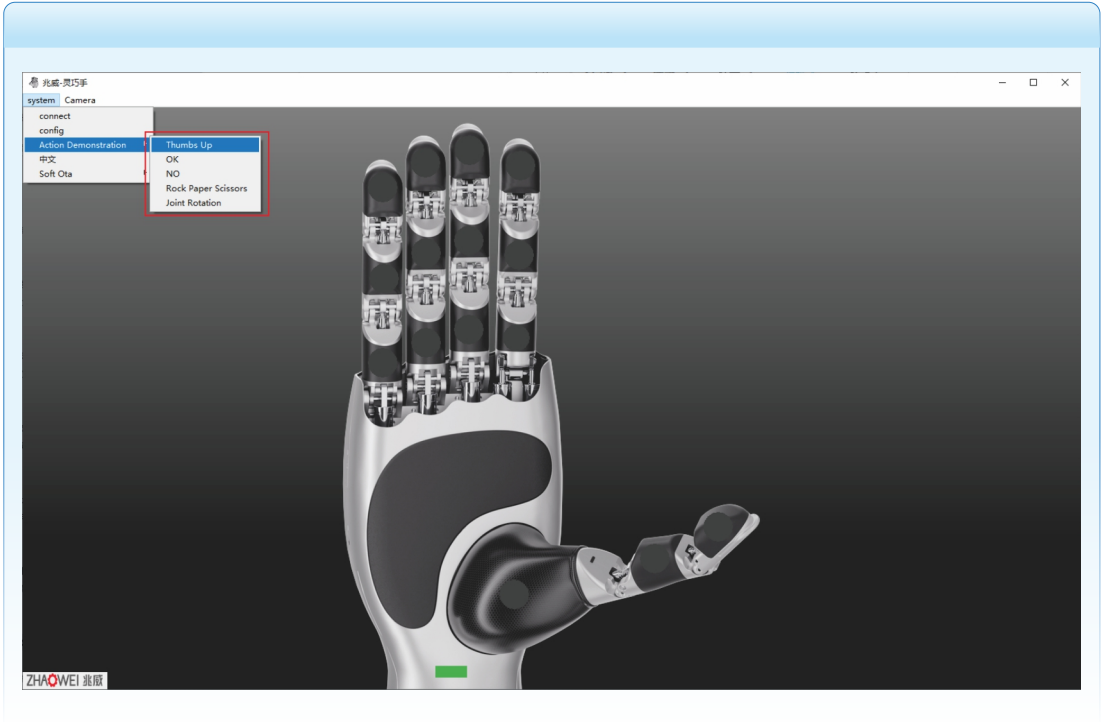
② Operation Procedure

Click the update button.

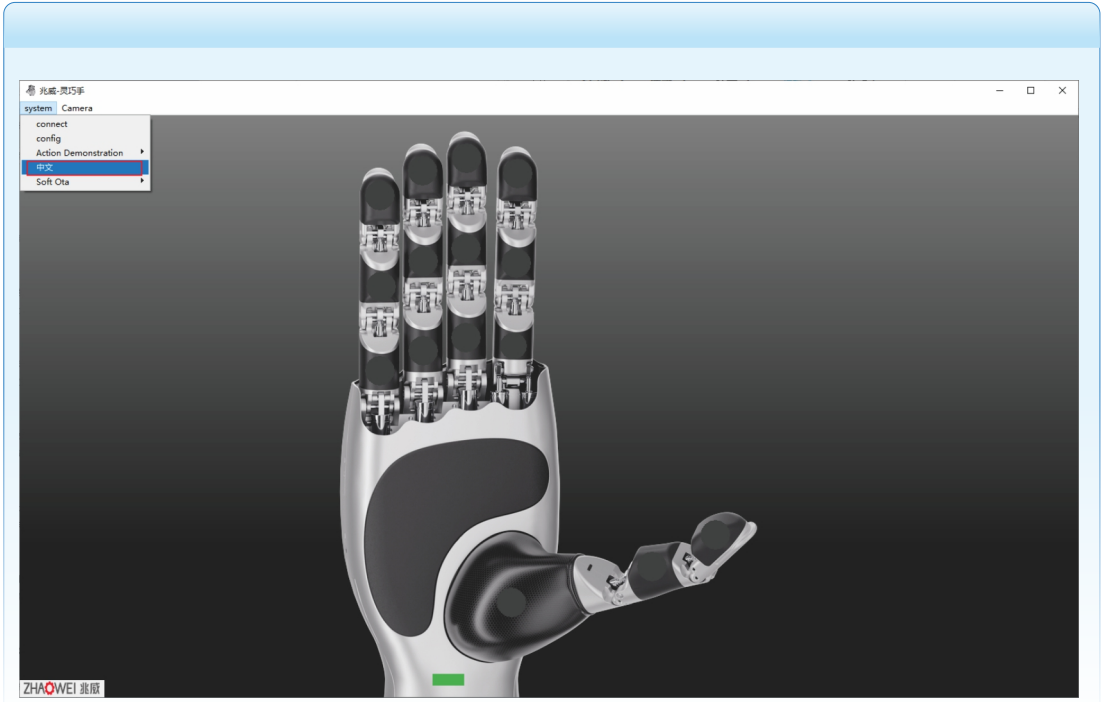
③ Device Info Update Success Display



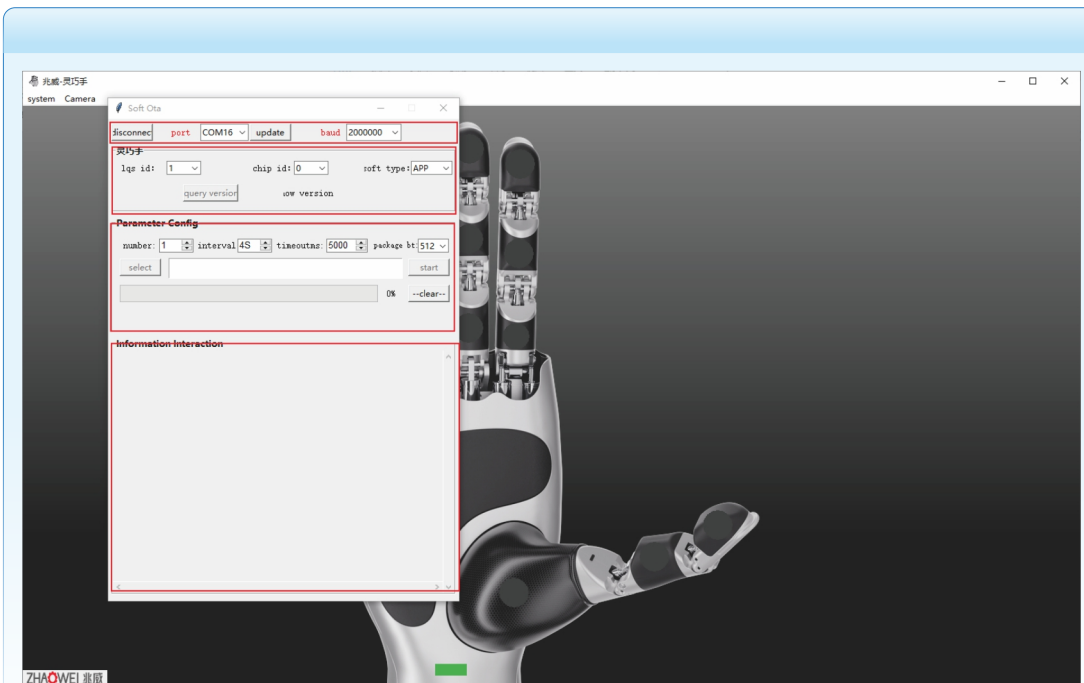
(7) ZWHAND Action Demonstration



(8) ZWHAND Language Toggle (Chinese/English)

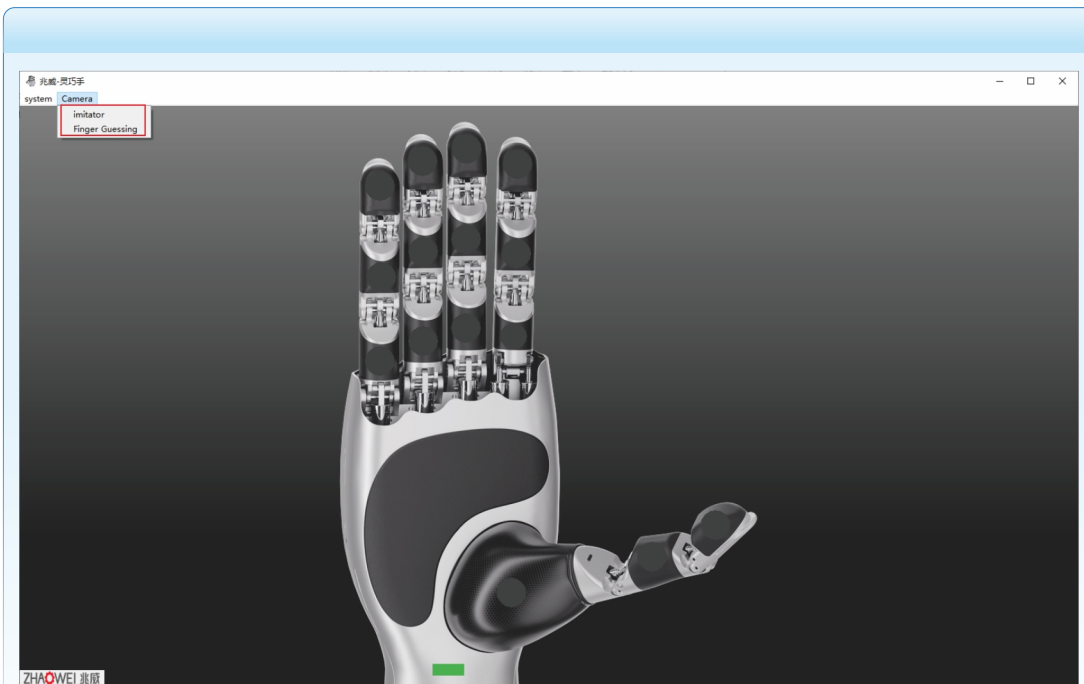


(9) ZWHAND Firmware Upgrade



Note: The connection settings used for firmware upgrades are independent of the connection configuration in the system menu.

(10) Vision-Based Gesture Capture

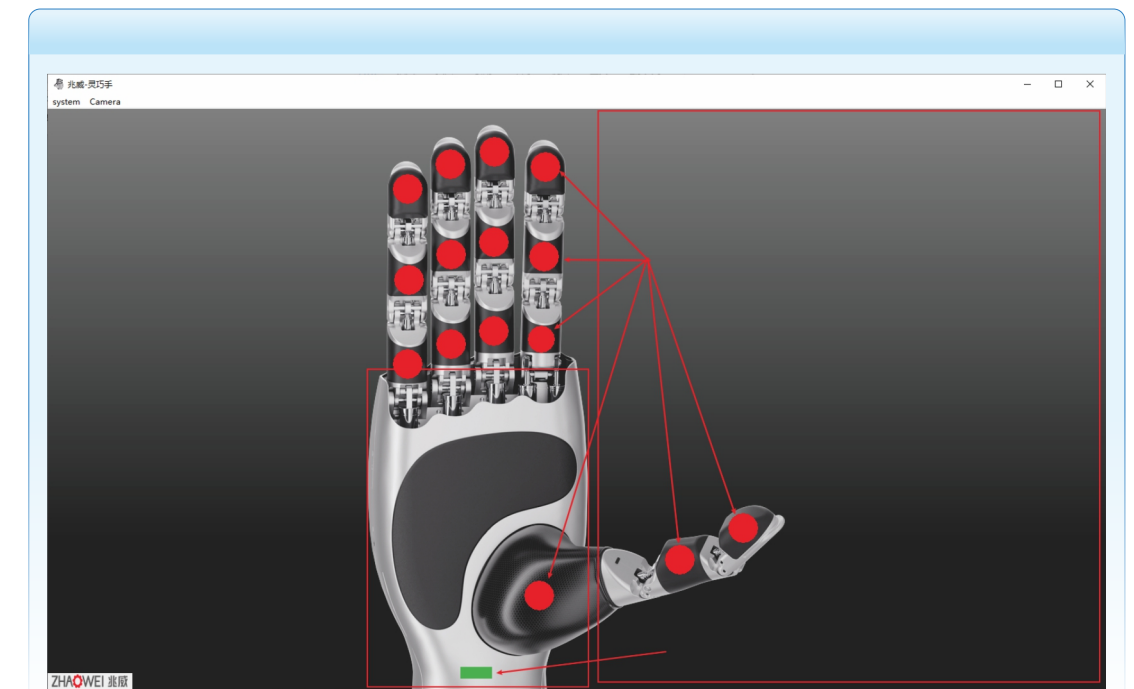


Imitation Mode: Mimics the user's hand joint bending (detects bent or straight state only).

Rock-Paper-Scissors Mode: Interacts with the user in a rock-paper-scissors game, with ZWHAND set as the winner.

3. Main Interface Function Overview

(1) Function Area Definitions



(2) Detailed Functional Descriptions

① Finger Joint Selection

Single Joint: Click the finger joint to select. Click again to deselect.

Multiple Joints: Drag a rectangle in the left section while holding the left mouse button. All joint centers inside the rectangle will be selected (or deselected if already selected).

② Switch to Debug Interface

Click the Connection Status button to enter the debug interface.

③ Full-Hand Calibration

Double-click the palm area to calibrate the entire hand.

④ Absolute Position Control — Vertical Axis

- Step 1:** Select the desired finger joint(s).
- Step 2:** Drag vertically in the right section with the left mouse button to control joint movement.

⑤ Absolute Position Control — Horizontal Axis

- Step 1:** Select the desired finger joint(s).
- Step 2:** Drag horizontally in the right section with the left mouse button to control joint movement.
- Note: Only applicable to thumb and index base joints.

⑥ Incremental Position Control — Vertical Axis

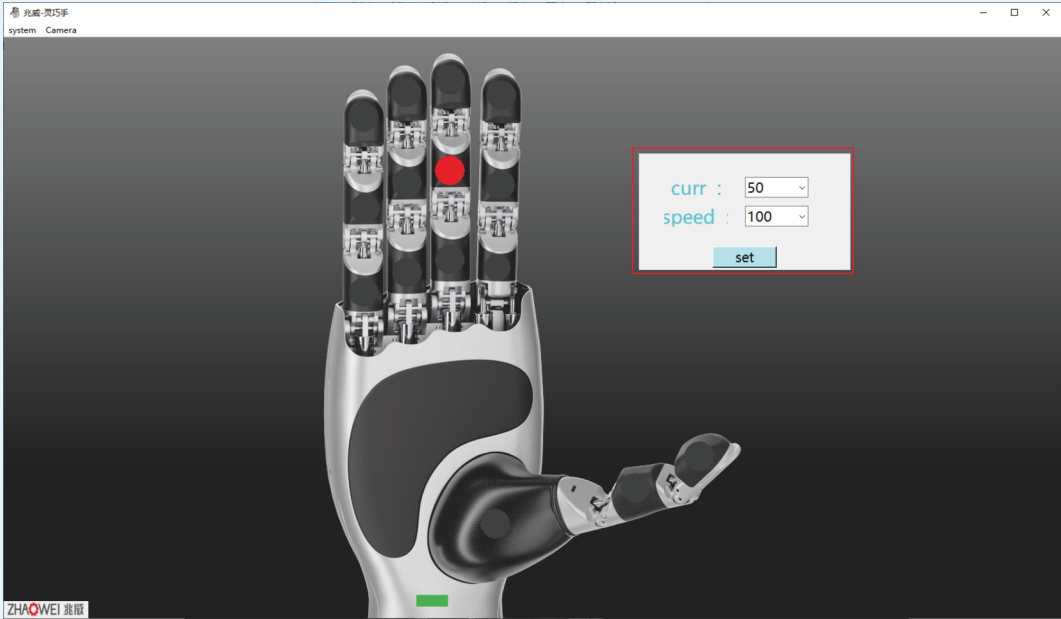
- Step 1:** Select the desired finger joint(s).
- Step 2:** Right-click in the upper or lower part of the right section to control movement.
- Note: upper area of right section is Increment; lower area of right section is decrement (increment value adjustable in the debug interface.)

⑦ Incremental Position Control — Horizontal Axis

- Step 1:** Select the desired finger joint(s).
- Step 2:** Right-click in the upper or lower part of the right section to control movement.
- Note: upper area of right section is Increment; lower area of right section is decrement (increment value adjustable in the debug interface.)

⑧ Speed and Current Settings

Step 1: Double-click any finger joint to open the settings panel.

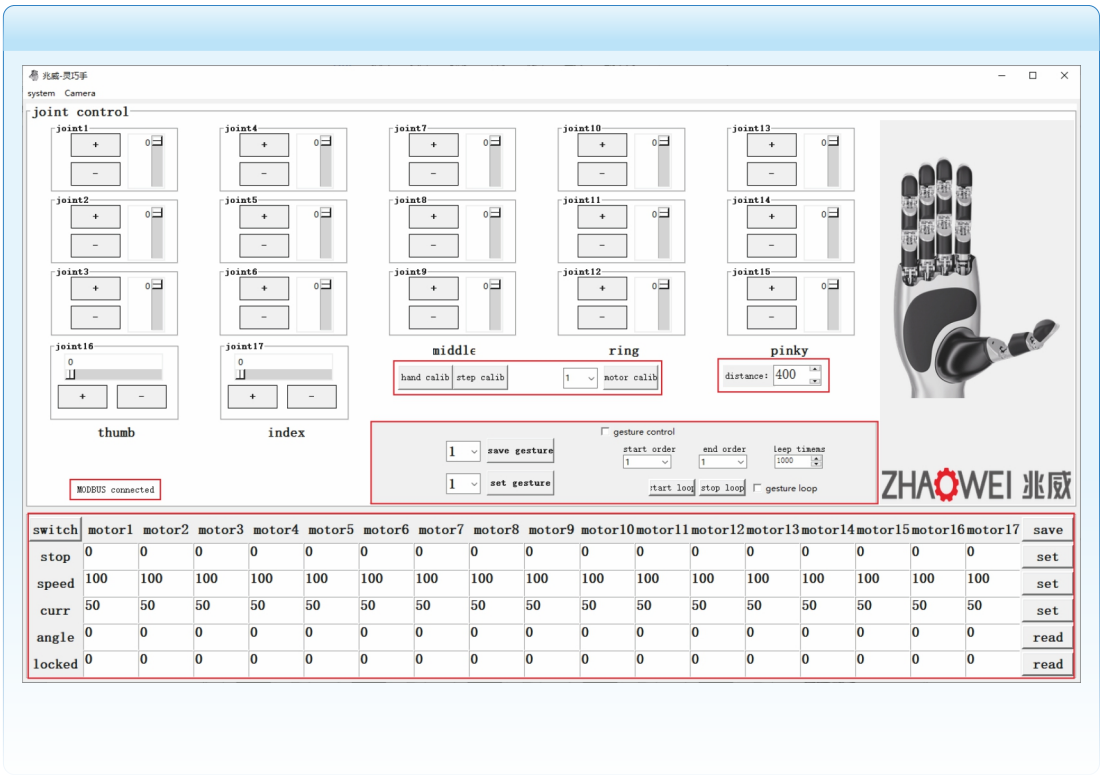


- Step 2:** Select the finger joint(s) to be configured.
- Step 3:** Enter a value (1 - 100) and click the Set button. The window will close on success; otherwise, it will remain open.

Note: The first operation applies settings to all joints by default; subsequent operations apply only to selected joints.

4. Debug Interface Function Overview

(1) Function Area Definitions



(2) Detailed Functional Descriptions

① Calibration Functions

- Full-Hand Calibration:** Click the hand calibration button in motor calibration area.
- All Stepper Calibration:** Click the stepp calibration button.
- Single Motor Calibration:** Select the target joint, then click the motor calibration button.

② Absolute Position Control - Vertical Axis

Control joint motion by dragging the vertical slider for each joint.

③ Absolute Position Control - Horizontal Axis (Joint 16 & 17 only)

Control joint motion by dragging the horizontal slider for the thumb and index base joints.

④ Incremental Position Control - Vertical Axis

- Step 1:** Set the increment value into distance bar for Motor Incremental Position Control .
- Step 2:** Click the + or - buttons for the corresponding joint to move forward or backward.

⑤ Incremental Position Control - Horizontal Axis (Joint 16 & 17)

- Step 1:** Set the increment value into distance bar for Motor Incremental Position Control .
- Step 2:** Click the + or - buttons for the corresponding joint to move forward or backward.

⑥ Save Gesture Function

- Step 1:** Use absolute position control to set each joint to the desired pose.
- Step 2:** Select a gesture index.
- Step 3:** Click Save Gesture to save the current pose.

Note: Default pose for each index is all-zero (post full-hand calibration).

⑦ Set Gesture Function

- Step 1:** Select a saved gesture index.
- Step 2:** Click Set Gesture to apply the pose.

⑧ Single-Loop Gesture Playback

- Step 1:** Enable Gesture Control (this disables Absolute Position Control and Incremental Position Control buttons of all joints).
- Step 2:** Select gesture Start Order, End Order, and Leap Time(ms).
- Step 3:** Click Start Loop to begin; click Stop Loop to stop immediately.

⑨ Infinite-Loop Gesture Playback

- Step 1:** Enable Gesture Control (this disables Absolute Position Control and Incremental Position Control buttons of all joints).
- Step 2:** Select gesture Start Order, End Order, and Leep Time(ms).
- Step 3:** Check the gesture loop.
- Step 4:** Click Start Loop to begin playback.

⑩ Main Interface Switching

Click the Switch button at the top-left corner of the Motor Status Info panel to return to the main interface.

⑪ Global Motor Status Parameter Settings (Stop, Speed, Current)

- Step 1:** Adjust the relevant parameters.
- Step 2:** Click the corresponding Set button to apply changes to all motors.

⑫ Global Motor Status Parameter Reading (Angle, Stall Status)

Click the corresponding Read button to retrieve angle and stall status for all motors.

⑬ Save Global Motor Status Parameters on Power-Off

Click the Save button in the top-right of the Motor Status Info area to store current parameters for power-down retention.