



# **ROH-AP001 DEXTEROUS HAND USER MANUAL**

**V1.0.6**

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## 1. Trademarks and Patents

ROHAND dexterous hand (ROH-AP001) is designed and produced by OYMotion Technologies Co., Ltd with IPs developed by the company. Any other group or individual may not reproduce and transmit any part of this article in any form or by any means (electronic, mechanical, etc.) for any purpose without the written permission from the company.

## 2. Warning and Caution

### Warning: ROH-AP001 dexterous hand is not waterproof.

- 2.1. Like all non-waterproof electronic products, the precision electronic circuits, power motors and mechanical structures inside the ROH-AP001 dexterous hand will cause circuit short circuits, rust, and irreversible damage when contaminated by liquid. Users must ensure that no liquid enters the dexterous hand during use, and users must not use the bionic hand in a humid or heavily dusty environment.
- 2.2. The main frame of the ROH-AP001 dexterous hand is composed of high-strength zinc, aluminum alloy and stainless steel, but its load-bearing must be within the design spec. A load that exceeds the design range will bring permanent metal deformation or even fracture, and the internal structure will be permanently damaged. Falling and hitting with heavy objects will also cause damage to the mechanical structure and circuitry of ROH-AP001 dexterous hand.

## 3. Introduction

ROH-AP001 dexterous hand features 11 movable joints, with 6 built-in motor drivers and motor control circuits, providing 6 active degrees of freedom. Equipped with a built-in PID motor control algorithm, it can simulate various human hand grasping operations. Each finger is fitted with a force sensor, enabling real-time monitoring and control of gripping force. Typical applications include robotic end-effectors, educational and research equipment, and bionic prosthetics, etc.

ROH-AP001 dexterous hand with UART, RS485 or CAN physical interface, support SerialCtrl dedicated serial protocol, ModBus-RTU protocol and CAN protocol, can provide ROS / ROS2 platforms for secondary development with SDK

## 4. Product Model

Type	Left/Right	Color	Interface Type	Other Functions
ROH-AP001LB ROH-AP001LB-C	■Left □Right	□Silver	■Integrated cable	■Rubber bumps on finger pads ■Finger touch screen function ■Finger force feedback
ROH-AP001RB ROH-AP001RB-C	□Left ■Right	■Black		

Note: Versions with suffix -C are CAN interface versions.

## 5. Product Main Parts and Size

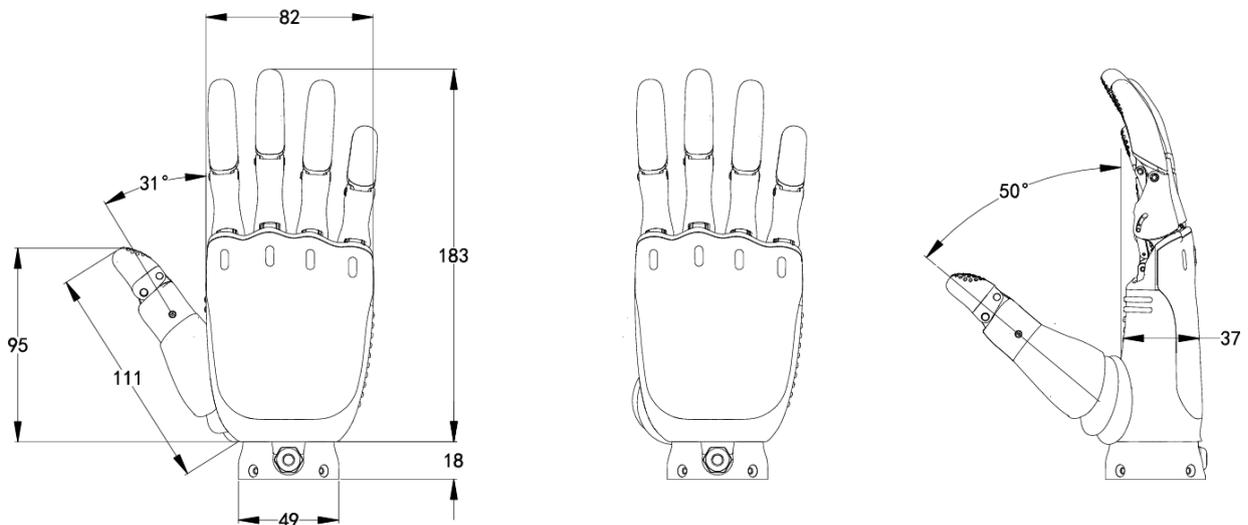
### 5.1. Material

Aluminum alloy, zinc alloy, stainless steel, silicone, plastic.

### 5.2. Structure



### 5.3. Dimensions



ROH-AP001 Dimensions and Angles

Vertical distance from the tip of the middle finger to the wrist	183 mm
Vertical distance from thumb tip to wrist	95 mm
Thumb length	111 mm
Maximum palm width	82 mm
Wrist diameter	49 mm
Maximum opening and closing angle of the thumb side	0~31 Degrees
Maximum opening and closing angle of thumb to palm	0~50 Degrees
Thumb lateral rotation angle	0~90 Degrees
Finger touch screen function	Supported
Finger force feedback	Supported

#### 5.4. Wrist

ROHAND-AP001 provides a variety of wrist designs to choose from and to meet different needs.

## 6. Storage, Transportation and Use Environment

Storage and transportation requirements:	Temperature: -10 degrees Celsius ~ +40 degrees Celsius
Placed in the original packaging box	Humidity: Maximum relative humidity 85%
Working environment	temperature: -10 degrees Celsius ~ +40 degrees Celsius Humidity: Maximum relative humidity 85%
Design service life-span	3 years

## 7. Technical parameters

### 7.1. Load and speed

Bending/stretching time for full range at maximum speed	0.7 second
Rotation time of thumb for full range at maximum speed	0.7 second
Active force of each fingertip on stretched state	$\geq 0.45$ Kgf
Active force of each fingertip on bended state	$\geq 1.0$ Kgf
Maximum active force of thumb tip	$\geq 1.0$ Kgf
Maximum passive load for four fingers on bended state	30 Kg
Maximum passive load for each finger on bended state	10 Kg
Maximum passive load for each finger on stretched state	8 Kg

**7.2. Weight**

Weight (including wrist) | 640g ± 5g

**7.3. Power and communication interface**

ROH-AP001 dexterous hand adopts **RS485**: DC 12-24V, CAN: 12-48V power supply, rated power **48W**.

ROH-AP001 dexterous hand supports UART, RS485, CAN interface, various interface parameters are as follows:

Communication Interface	Baud Rate	Supported Protocol
UART	9600/19200/38400/57600/115200/230400/460800/921600	SerialCtrl ModBus-RTU
RS485	9600/19200/38400/57600/115200/230400/460800	SerialCtrl ModBus-RTU
CAN	1M	CanSerialCtrl

The ROH-AP001LB/ROH-AP001RB type is equipped with 4-conductor XH2.54 terminal blocks with a pitch of 2.54 mm on the PCB, and the connector definitions are as follows.

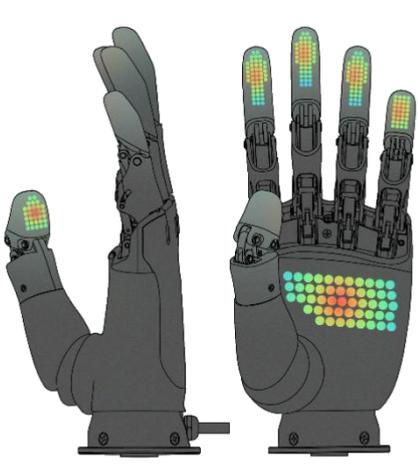


Pin No.	Signals	Colors
1	Marked "B", the DATA+ / B signal line of the RS485 bus; Marked "H": CAN-H differential signaling line of the CAN bus;	White
2	Marked "A", the DATA- / A signal line of the RS485 bus; Marked "L": CAN-L differential signaling line of the CAN bus;	Brown

3	Marked “-”, power ground wire	Black
4	Marked as "+", DC 24V power input, 2A current	Red

The standard length of the interface cable is **50cm**, and customers can also customize the length

**7.4. Force sensor**

	Sensor Area (Dots)	Thumb: 7×5 Index finger: 12×5 Middle finger: 12×5 Ring finger: 12×5 Little finger: 8×4 Palm: 11×5
	Force Range	0.1N ~ 25N
	Repeatability Accuracy	±20% (500g load)
	Refresh rate	150Hz

**8. Maintenance, Warranty and After-sales Service**

**8.1. Maintenance**

- 8.1.1. Clean regularly during use. It is recommended to use disinfectant wiper to clean up the outer surface of the product, be careful not to let the cleaning liquid seep into the palm of the hand.
- 8.1.2. Do not disassemble it by yourself. If the product needs service, contact the designated after-sales service center.

**8.2. Warranty**

- 8.2.1. 12-month warranty period from the date of sale.

**8.3. After-sales service**

- 8.3.1. Usage and technical support services are provided through internet or telephone.
- 8.3.2. During the warranty period, the manufacturer provides free maintenance and parts replacement; outside the warranty period, the manufacturer provides paid maintenance services. If parts are damaged, the manufacturer will charge for the parts. User bears shipping costs.

- 8.3.3. When the product needs to be sent for repair, the user should ensure that the product is properly packaged and suitable for transportation. Damage or loss caused by transportation is not covered by the warranty.
- 8.3.4. The following situations do not fall within the scope of warranty promised by Party A, including:
- (1) Wear and wore caused by normal use of the product;
  - (2) Product damage caused by human factors, such as damage caused by water immersion, impact, improper storage, unauthorized disassembly, improper transportation, etc.;
  - (3) Damage caused by force majeure factors.
- 8.3.5. If the failure is caused by human error, or beyond the warranty period, or force majeure factors, the manufacturer will charge parts and maintenance fees.

## 9. Packing list

- 9.1. ROHAND dexterous hand (model ROH-AP001): 1 piece
- 9.2. User manual: 1 copy
- 9.3. Certificate: 1 piece
- 9.4. Warranty card: 1 piece

## 10. Optional tool package

Interface	Tools	Amount	Figure	Description
RS-485	24V / 60W Power Adapter	1		DC Stabilized Power Supply Dimensions: 2.1Φ×5.5Φ×11mm
	USB-485 Module	1		USB to 485 converter, can be shared by multiple devices
	Power/communication cable	1		Power and communication cable with DC socket
	2-Pole quick wiring terminals	2		2-Pole quick connect terminals, for interfacing with user's cables

Interface	Tools	Amount	Figure	Description
CAN	24V / 60W Power Adapter	1		DC Stabilized Power Supply Dimensions: 2.1Φ×5.5Φ×11mm
	USB-CAN module	1		USB to CAN converter, type IPEH-002022, can be shared by multiple devices
	Power/communication cable	1		Power and communication cable with DC socket
	2-Pole quick wiring terminals	2		2-Pole quick connect terminals, for interfacing with user's cables

## 11. Contact Information

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## 12.Revision History

Date	Revision	Modified content
2025.5.9	V1.0	Initial version.
2025.5.10	V1.0.1	Modified model descriptions; Adjusted layout; Added force transducer point diagrams Added revision history.
2025.5.13	V1.0.2	Modified header and figure in 7.3; Added revision history.
2025.5.23	V1.0.3	Modified figures in tool package; Added revision history.
2025.6.10	V1.0.4	Adjusted of the contents of the optional toolkit accessories; Modified CAN protocol description; Added the version number.
2025.9.5	V1.0.5	Modified address information; Modified version number.
2026.2.6	V1.0.6	Modified picture of tool package; Modified version number.