## **Elephant Robot Product Brochure**

# myAGV

Elephant Robotics Mobile Robot



Language: English

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### **Manual overview**

### About the manual

Welcome to the myAGV series of collaborative robots and thank you for your purchase.

This manual describes how to properly install and use myAGV series collaborative robots, and related matters that need attention.

Before installing and using the robot, please read the manual and related manuals carefully. After reading, please keep it in a safe place for easy access.

### **Readers of the manual**

This manual is for:

- Installers.
- Debugging personnel.
- Maintenance personnel.

Personnel performing installation/commissioning/maintenance work on the myAGV series of cobots must be trained by Elephant Robotics and possess the mechanical and electrical knowledge required for the work described above.

### Manual usage

This manual should be used when:

- Installation work: Move the robot to the working position and fix it on the base according to the installation instructions, place other parts in appropriate positions and complete the electrical connection.
- Debug work: debug the robot to the working state.

 Maintenance work: The robot system is regularly maintained to ensure its normal function; when the robot fails due to environmental impact or improper operation of the user, a certain component in the robot system exceeds the normal service life and many other reasons, Maintenance work on the robot is required.

#### **Remark:**

1. This manual is updated from time to time, and the update date is the version number. Users can download the latest version on the official website of Elephant Robot.

2. This manual is only applicable to users in mainland China.

### **Chapter 1 Safety Instructions**

### **1.1 Introduction**

This chapter details general safety information for personnel performing installation, maintenance and repair work on the Elephant Robot. Please fully read and understand the contents and precautions in this chapter before handling, installation and use.

### **1.2 Hazard identification**

The safety of collaborative robots is based on the correct configuration and use of robots. Also, even if all safety instructions are followed, operator injury or injury may still occur. Therefore, it is very important to understand the safety hazards of robot use, which is conducive to preventing problems before they occur.

The following tables 1-1~3 are the common safety hazards that may exist in the situation of using robots:



#### Table 1-1 Hazardous safety hazards



safety protection tools are not installed, etc., so that the safety function of the robot

fails to function, thus causing danger.

#### Table 1-2 Warning-level security risks



5	If the clamping is not in place or the robot power supply and air supply are turned
	off (it is not determined whether the end effector is firm and the clamped object
	falls down due to loss of power), the clamped object may not be removed, which
	may cause danger, such as damage to the end effector, People were injured, etc.
6	There is a risk of unintended movement of the robot, under no circumstances
	should you stand under any axis of the robot!
7	The robot is a precision machine. If it cannot be placed smoothly during



	robot.
8	Compared with ordinary mechanical equipment, the robot has more degrees of
	freedom and a larger range of motion. Unsatisfactory motion range may cause
	accidental collision.

#### Table 1-3 Safety hazards that may cause electric shock

	Danger Electric Shock
1	Use of non-original cables may present unknown hazards.
2	The electrical equipment may be in contact with liquid, which may cause electric leakage hazard.
3	There may be an electric shock hazard if the electrical connection is incorrect.
4	Be sure to perform replacement work after turning off the power of the controller and related devices and unplugging the power plug. Working with the power on may result in electric shock or malfunction.

### **1.3 Safety Precautions**

#### The following safety rules should be followed when using the robotic arm:

- The robotic arm is a live device, and non-professionals are not allowed to change the line at will, otherwise it will easily cause injury to the device or the person.
- When operating the robot arm, you should strictly abide by the local laws and regulations. The safety precautions described in the manual and the "Danger", "Warning" and "Caution" described in the manual are only supplements to the local safety regulations.

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- Please use the robot arm within the specified environment. Exceeding the specifications and load conditions of the robot arm will shorten the service life of the product or even damage the equipment.
- The personnel responsible for the installation, operation and maintenance of the myAGV manipulator must first undergo strict training, understand various safety precautions, and master the robot can only be operated and maintained after the correct operation and maintenance method.
- Do not use this product in a humid environment for a long time. This product is a precision electronic component. Working in a humid environment for a long time will damage the equipment.
- Do not use this device in a high temperature environment.
- The outer surface of this equipment is made of photosensitive resin, and the higher temperature will damage the outer casing of the equipment and cause equipment failure.
- Highly corrosive cleaning is not suitable for robotic arm cleaning, and anodized parts are not suitable for immersion cleaning.
- Do not use this product without the base installed to avoid damage to the device or accidents.
- This product should be used in a fixed environment with no obstacles around.
- Do not use other power adapters for power supply.
- Damage to the device caused by the use of a substandard adapter will not be covered by the after-sales service.
- Do not disassemble, disassemble, or unscrew the screws or casing of the robotic arm. If disassembled, no warranty service will be provided.
- Without professional training, it is not allowed to repair the faulty product or

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disassemble the robotic arm without authorization. If the product fails, please contact the myCobot technical support engineer in time.

- If the product is scrapped, please comply with relevant laws and properly dispose of industrial waste to protect the environment.
- When children use it, someone must be there to monitor it, and turn off the device in time when the operation is completed.
- During the movement of the robot, please do not put your hand into the movement range of the robot arm, be careful of bumps.
- It is strictly forbidden to change or remove and modify the nameplates, instructions, icons and marks of the robotic arm and related equipment. Please be careful during handling and installation. Follow the instructions on the box to handle it carefully, and place the robot correctly in the direction of the arrow, otherwise the machine will be easily damaged.
- Do not burn other product drivers without authorization, or use unofficial recommended methods to burn firmware. If the device is damaged due to the user's personal burning of other firmware, it will not be included in the after-sales service.

If you have any questions or suggestions about the contents of the manual, you can

log in to the official website of Elephant Robot and submit relevant information:

https://www.elephantrobotics.com

#### Please do not use the robotic arm for the following purposes:

- Medical and life-critical applications.
- In potentially explosive environments.
- Used directly without risk assessment.
- Insufficient use of the safety function level.
- The use of non-compliant robot performance parameters.

### **Chapter 2 Product Introduction**

### 2.1 Design Background

Adhering to the vision and mission of "Enjoy Robots World", Elephant Robots has designed and developed myCobot - the world's lightest and smallest collaborative robot while retaining most of the functions of industrial robots. Small and elegant industrial design, excellent performance and dynamic performance and huge software and hardware development space endow myCobot with unlimited application development potential.

The design prototype of myCobot is the first domestic all-in-one integrated collaborative robot launched by Elephant Robot in 2018. As the first integrated collaborative robot in China, it has won the 2019 CAIMRS Industrial Robot Innovation Award and the 2019 High-tech Robot Annual "Innovative Technology Award", and has been exported to more than 30 countries at home and abroad. Its product quality and smart solutions are even better. It has been unanimously recognized and praised by several factories from the world's top 500 famous enterprises such as Korea, Japan, Germany, Italy and the United States.

### **2.2 Product Introduction**

myAGV is the first mobile robot of Elephant. It adopts competition-grade Mecanum wheels and fully wraps the metal frame. The ROS development platform has two built-in SLAM algorithms to meet the learning of mapping and navigation directions. It provides rich expansion interfaces and can be equipped with my series. The robotic arm realizes mobile grabbing and completes more applications.

### 2.2.1 Product basic parameters

Index	Parameter
Name	myAGV
Dimensions	311x236x130mm
Weight	3.6kg
Weight capacity	2kg
Working time	1~1.5h
Standby time	1.5~2h
Charging time	3.5~4h
Charging voltage	12V, 2A
Tire type	Mecanum Wheel
Motor type	Hall encoder motor
Maximum movement speed	0.9m/s
Lidar	360°
Distance measurement range	0.12-8m
Built-in controller	raspberry Pi 4B 2GB
Built-in camera	5-million pixel

#### 2.2.2 Features

#### **Omnidirectional movement**

 Competition-level Mecanum wheels, Fully Wrapped Metal Frame, Removable Split Structure.

#### SLAM Lidar

• The built-in gmapping and cartographer algorithms for ROS.Real-time mapping and scanning of Lidar, automatic path planning for obstacle avoidance and navigation.

#### Built-in camera

• 5 million high-definition camera for object recognition and precise positioning.

#### Additional extensions

Double-sided magazines on the body: increased batteries lengthen the working time;
Can equip with the suction pump and cooperate with the robotic arm to achieve more applications.

#### Cargo robot

• It can carry and transport different sizes of cargo boxes arbitrarily. Release your hands.

#### compound robot

 It can be equipped with MY series of robotic arms to realize mobile grabbing, expand the workspace, and enable it to complete more tasks.

#### Multiple ways to play

• The gamepad control supports multi-robots collaboration in real-time.

### 2.3 Robot hardware structure

#### 2.3.1 Microprocessor and Actuator

#### 2.3.1.1 Raspberry Pi 4B

Raspberry Pi (Chinese name "Raspberry Pi", abbreviated as RPi, (or RasPi / RPI) is designed for students' computer programming education, only a credit card-sized microcomputer, its system is based on Linux, with the release of Windows 10 IoT, we will also be able to use the Raspberry Pi running Windows. Despite its "petite" appearance, its "heart" is very powerful, and it has all functions such as video and audio.

It is an ARM-based microcomputer motherboard with SD/MicroSD card as the memory hard disk. There are 1/2/4 USB ports and a 10/100 Ethernet port around the card motherboard (type A has no network port), which can be connected to Keyboard, mouse and network cable, as well as TV output interface for video analog signal and HDMI high-definition video output interface, all the above components are integrated on a motherboard that is only slightly larger than a credit card, with all the basic functions of a PC, just connect the TV And the keyboard, you can perform functions such as spreadsheets, word processing, playing games, playing high-definition video, and many more. The Raspberry Pi B model only provides a computer board, no memory, power supply, keyboard, case or wiring.

Supported development platforms and programming languages: myBlockly, roboFlow, python, ROS. No matter where your development and programming skills lie, M5Stack will assist you, step by step, to bring your ideas to life.

#### a) Product Features

- BROADCOM BCM2711 processor
- 4 core CORTEX-A72
- Manufacturing process 28nm
- 1.5GHz main frequency

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- Extensible pins and interfaces
- USB interface upgrade 3.0
- Development platform myBlockly, roboFlow, python, ROS

#### b) Specifications

master resource	parameter	
Broadcom BCM2711	1.5-GHz, Quad-Core Broadcom,BCM2711B0 (Cortex A-72)	
Flash	4MB	
Input voltage	3A, 5V	
Bluetooth	Bluetooth5.0	
GPU	500 MHz VideoCore VI	
peripheral equipment	GPIO*17, HAT, UART*4, SPI*4, I2C*4	
lmage output	Dual micro HDMI ports	
maximum resolution	4K60 Hz + 1080p or 2X4K30 Hz	
USB port	2 个 USB 3.0/2x USB 2.0	
wired network	Gigabit Ethernet	
wireless	802.11ac (2.4/5 GHz),Bluetooth 5.0	
charging port	USBType-C	
multimedia	H.265 (4Kp60 decode);H.264 encode(1080p30/1080p60);OpenGL ES ,3-0 graphics	
size	3.5 x 2.3 x 0.76 inches (88 x 58 x19.5mm)	
weight	46g	
shell material	abs injection molding	



### **2.3.2Robot Dimensions Specifications Dimensions**





Figure 2-1 Robot Dimensions and Specifications

### 2.4 Robot electrical interface

### 2.4.1 Electrical Interface

#### 2.4.1.1 Interface introduction

	• • •
6	
P.	1 Power supply port for robotic arm 3 HDMI interface 2 IO interface 4 USB 2.0 interface 5 The network interface
	6 Power switch button
	Power charging port

Figure2-2 myAGV interface introduction

- ① Power supply port for robotic arm
- ② IO interface group
- ③ HDMI interface
- ④ USB 2.0 interface
- ⑤ The network interface
- 6 Power switch button
- ⑦ Power charging port

#### 2.4.1.2 Electrical interface description

A. The power supply interface of the manipulator: Banana plug female, model XT30UPB-F, supplies power to MY series manipulator (8.4V 5A).

B. I/O interface group: All ports are 2.54mm DuPont ports. External 2.54mm Dupont cables can be used. The following table defines the ports.

Label	Signal	Function	Remarks
7	G7	3.3 V-OUT-PNP output /3.3 V-INT input	
8	G8	3.3 V-OUT-PNP output /3.3 V-INT input	
25	G25	3.3 V-OUT-PNP output /3.3 V-INT input	
24	G24	3.3 V-OUT-PNP output /3.3 V-INT input	
23	G23	3.3 V-OUT-PNP output /3.3 V-INT input	
18	G18	3.3 V-OUT-PNP output /3.3 V-INT input	
G	GND	GND	
11	G11	3.3 V-OUT-PNP output /3.3 V-INT input	
9	G9	3.3 V-OUT-PNP output /3.3 V-INT input	
10	G10	3.3 V-OUT-PNP output /3.3 V-INT input	
22	G22	3.3 V-OUT-PNP output /3.3 V-INT input	
27	G27	3.3 V-OUT-PNP output /3.3 V-INT input	
17	G17	3.3 V-OUT-PNP output /3.3 V-INT input	
3V3	3V3	DC 3.3V	

Table 2-1 I/O interface group description

C.HDMI interface: This is an HDMI D-type interface (as shown in Figure 2-3) for connecting to the monitor.





Figure 2-3 HDMI D-type interface

D.USB 2.0 interface: Serial bus standard 2.0 for data connection interface; Users can use the USB interface to copy program files and can also use the USB interface to connect peripherals such and keyboard.



Figure 2-4 USB interface definition diagram

E.The network interface: Network data connection port, the user can use the network interface can be used for PC and robot system communication interaction, can also be used for Ethernet communication with other devices.





Figure 2-5 Network interface definition diagram

F.Power switch button: Press down to turn on myAGV.

G.Power charging port: Use DC 2.5\*5.5 power port; myAGV can be charged using the 12V2A DC power adapter provided by the manufacturer.

### 2.5 Robot installation teaching

#### 2.5.1Unpacking and working environment

**Note:** After the packaging box is in place, please confirm that the robot packaging is intact. If it is damaged, please contact the logistics company and the supplier in your area in time. After unpacking, please check the actual items in the box according to the item list.

Product Contents of myAGV [Standard	- myAGV
Set]	- myAGV-Product gallery
	- myCobot-Supporting power supply
	- Handle
	- HDMI
	- Jumper
	- lego

Table 2-2myAGV [standard set]

Install the robot system in an environment that meets the conditions described in the

table in order to develop and maintain the performance of this machine and use it safely.

temperature	-10°C~45°C
Relative humidity	20%~70%
Indoor and outdoor requirements	indoor
Other environmental requirements	- Avoid sunlight exposure.
	- Keep away from dust, oil fume, salt, iron
	filings, etc.
	- Keep away from flammable and corrosive
	liquids and gases.
	- Must not come into contact with water.
	- Does not transmit shock and vibration etc.
	- Keep away from strong electromagnetic
	interference sources.

#### Table 2-3 Working Environment and Conditions

### **Chapter 3 Use of Basic Functions**

### 3.1 First use

First of all, congratulations on getting an interesting myAGV.

Using this advanced myAGV, you can give full play to your brain hole to create and realize various unrestrained functions.

Then, let's start.

**Note:** The car must be fully charged before using it for the first time. The indicator light of the power adapter is red for charging and green for fully charged.

#### 3.1.1 Boot

#### 3.1.1.1 Connect the HDMI port to the monitor

Before starting the car, be sure to connect the screen first, and connect the HDMI interface of the car to the HDMI interface of the screen through an HDMI transmission cable. This is because when the car's system is started, a physical screen must be connected to start the car's operating system normally.

#### 3.1.1.2 Connect a keyboard and mouse

The car has a built-in Raspberry Pi development board, and there are two USB2.0 ports on the back of the car, as shown in the figure below to connect the keyboard and mouse.



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#### 3.1.1.3 Press the power button

Press the power button to start the car, wait for about a minute, and you will enter the login interface.



#### 3.1.2 Internet

After the first boot, we can connect myAGV to WiFi, which is convenient for us to download software and update code.

First click on this icon in the top right corner:



Check Enable Networking and Enable Wi-Fi, to ensure that there are two pair  $\sqrt{s}$  s before both options

After clicking on, check Enable Networking and Enable Wi-Fi to ensure that there are two checkmarks in front of these two options  $\sqrt{}$ 

	\$ <del>?</del>	🗲 🕪	30 Jun, 15:11
Ethernet Network			
device not managed			
Wi-Fi Networks			
Elephant VIFI	((?		
Disconnect			
210-2	1		
9H	(f;		
ChinaNet-5KJx	1		
ChinaNet-NR4q	1		
ElephantWiFi5G-2	()	/	
More networks	•		
Connect to Hidden Wi-Fi Network			
Create New Wi-Fi Network			
VPN Connections	*		
Enable Networking			
🕑 Enable Wi-Fi			
Connection Information			
Edit Connections			
https://bi	og.cs	dn.net/	L_jerrydad

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At this time, you can see the wifi information that we can connect nearby, and select your wifi input password to successfully connect.

The above are some initialization operations used by myAGV for the first time after unpacking. Have a good time!

### **Chapter 4 After-Sale Service Policy**

### 4.1 General terms and conditions

#### 4.1.1 Service scope

The product can be returned without any reason if it is not opened within seven days from receipt. Costs and other risks arising from product replacement shall be borne by the user.

Any hardware failure caused by product quality problems under normal use, **Within the warranty period, the elephant robot will be repaired free of charge.** The warranty starts on the date of purchase or receipt of logistics.

#### 4.1.2 How to get after-sales service

If the user needs product warranty service, he/she shall provide the corresponding purchase receipt or product warranty card as the warranty certificate.

If you need after-sale service of the following products, please contact customer service in advance to communicate and confirm relevant information. The following is a detailed description of the parts warranty service. **Note: if there is any conflict with the product brochure, the product manual shall prevail.** 

### 4.1.3 Elephant robot solution

The repaired and replaced parts belong to the robot, while the replaced parts belong to the user, and appropriate costs will be charged when necessary.

### 4.1.4 Your other rights

This warranty statement grants you additional, specific rights. You may also have other legal rights, depending on the applicable laws of your country/territory or

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jurisdiction. You may have other rights depending on your written agreement with The Elephant Robot. Nothing contained in this warranty statement shall affect legal rights that may not be waived or limited by contract, including rights granted to consumers by laws or regulations regulating the sale of consumer goods.

### 4.2 Warranty period list of major components

### 4.2.1 The steering gear

The warranty period	The warranty service
A month or less	Our company will provide new steering gear free of charge and bear the round-trip freight (only once).
1 to 3 months	Our company provides new steering gear free of charge, and the user will bear the round-trip freight (only once).
More than 3 months	Users need to repurchase

### **4.2.2 Electronic components**

The warranty period	The warranty service
3 months or less	It will be disassembled by the user and sent back, and our company will replace it free of charge and bear the round-trip freight (only once).
3 to 6 months	After being disassembled by the user, send it back and bear the round-trip freight. Our company will replace it for free (only once).
More than 6 months	Users need to repurchase

### 4.2.3 Structural parts, including shell parts

The warranty period	The warranty service
1 year or less	Our company provides new parts free of charge and the user bears the round-trip freight (only once).
1 year or more	Users need to repurchase

### 4.3 After-sales service type

Elephant robot provides you with the following after-sales service: return service, replacement service and warranty service. For more information, please contact the pre-sale butler or after-sale butler of Elephant Robot, as well as the authorized agent of Elephant Robot.

#### 4.3.1 Return service

You can apply for return if you meet the following conditions:

✓ Within 7 natural days after the user receives the product, the outer packaging, accessories, gifts and instructions of the product are complete, and there is no artificial damage, which does not affect the secondary sales;

✓ Within 7 natural days after receiving the product, the user discovers that the product has a performance fault that is not caused by human.

### 4.3.2 A replacement service

You can apply for replacement if you meet the following conditions:

✓ Within 15 natural days after receiving the goods, the user finds that the products are damaged in the course of transportation and can provide the goods damage certificate provided by the transportation company;

✓ Within 15 natural days after the customer receives the goods, the product is found to be

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seriously inconsistent with the description of the original product in one or more important aspects;

✓ Within 15 natural days after the customer received the goods, the product is found to have non-human damage performance fault.

### 4.3.3 Apply for warranty service

In the valid warranty period of the product performance fault, you can apply for product warranty service. See Section 5.2 for the warranty period of major components.

### **Chapter 5 Contact us**

- Official website of Elephant Robot: https://www.elephantrobotics.com/
- Official flagship store of Elephant Robot:

https://shop504055678.taobao.com/?spm=a1z10.1-c-s.0.0.561558e72VTFIG

• If you have purchase intention or any parameter questions, please add pre-sales butler wechat.



• Anyway, if the problem listed doesn't help solve the problem, and you have more after-sales problems to consult, you add a after-sales butler to the wechat.

