



EAI LEO ROS Teaching Robot Product Manual

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(YDLIDAR for short)
www.eaibot.com
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🛡 Disclaimer

To the maximum extent permitted by law, the products described in this manual are provided "as is". If the products are not used or stored in accordance with this manual, there may be defects, errors or malfunctions on them. EAIYuedeng Technology does not provide any form of express or implied warranties, including but not limited to the warranties of merchantability, quality satisfaction, fitness for a particular purpose, non-infringement of third-party rights, etc., nor does it compensate for any special, incidental, accidental or indirect damages resulting from the use of this manual or the use of our products.

🛡 Important safety notes

- Children must be monitored by others when they are using the device, and the device should be turned off in time when the operation is completed.
- Please prevent the trolley from getting wet by water or other liquid, and prevent the internal electronic short circuit.
- During the operation of the trolley, please do not put your hands into the wheel set and be careful of injuries.
- Control the operation of the trolley and please be careful not to bump into anything else.

ⓘ Symbol notation

Description	Note	Warnings
Glossary or reference	Important notes	Important warnings

1. Resource list

 Enter  Support and  Download  Leo acquires the download center center related resources www.eaibot.cn

Software

- RosStudio: ROSrobot integrated development environment (**IDE**) uses the visualized windows to operate ROS trolley, analyze ROS architecture, compile source code, configure parameters, debug compilation and carry out one-click deployment, etc.
- RosCore: Android APP. Including map building, navigation, map editing, task editing and other functions.

Documents

《EAI RosStudio Operation Manual》
《EAI RosStudio Installation Guide》
《EAI RosCore APP User Manual》
《EAI LEO Driver Node Instruction》: STM32 Drive Protocol document.

Application development materials

Android SDK development source code package.

《RosCore Android SDK Usage document》

2. Operation method

Android Mobile APP

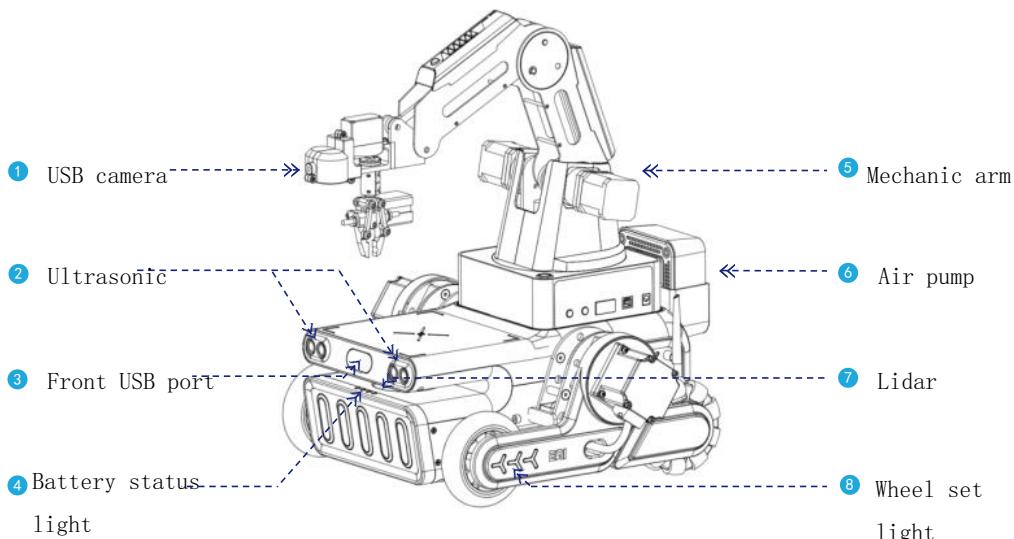
Usage reference: 《EAI RosCore APP User Manual》

RosStudio

Usage reference: 《RosStudio Operation Manual》, 《EAI RosStudio Installation Guide》

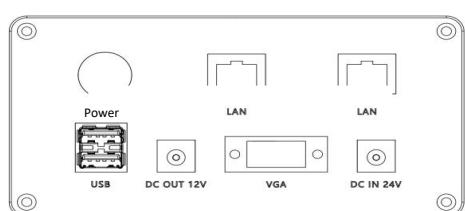
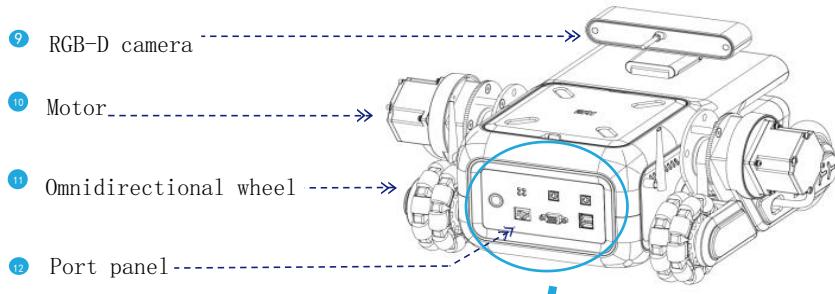
Algorithm development and parameter optimization are supported.

3. Appearance



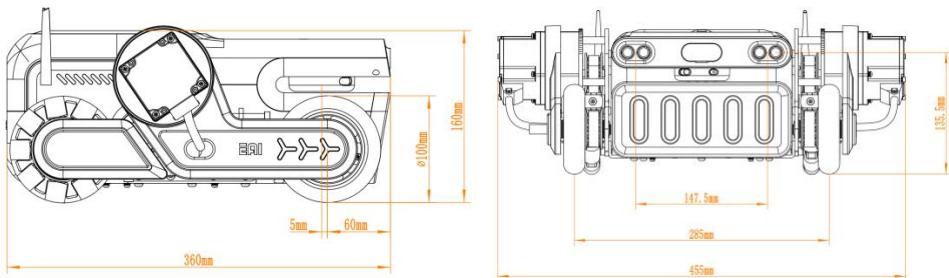
Indicator description

wheel set light	All lights are blinking	The machine is in the standby status
	Keeping stream blinking	The machine is in the motion status
	Stream blinking	The machine is in the normal charging status
	Only one light is blinking	The machine is in the charging error status
Battery status light	Describe how much power is left	



4. Technical Specification

4.1 Dimension Parameters



4.2 Technical Data

Overall structure

Drive methods	Differential control
Drive wheel	4 inch rubber wheel
Main structural materials	Sheet metal, ABS
Dead weight	About 10kg

-Processor performance

Processor	INTEL I5
Internal memory	DDR3 4G
Memory	128G SSD(Solid state disk)

Sensor parameters

Lidar	EAI G1 high-precision lidar
Motor	Brushless DC motor
Obstacle avoidance sensor	Ultrasonic module*2
IMU module	MEMS gyroscope, 3-axis accelerometer *1 installed in front(optional), *1 mounted by hanging via mechanic arm (optional)
RGB camera	*1(Optional)
Depth RGB-D camera	DOBOT magician mechanic arm (optional)

Battery and battery life

Battery type	Power lithium battery
Battery capacity	11.2Ah/24V
Charging time	About 4.5 hours
Charging voltage	29.4V
Battery life	About 8 hours

Motion capability

Climbing capability	12°
Vertical obstacle crossing ability	18mm
Motion speed	1m/s

Control method

APP control	Support
RosStudio IDE control	Support
Remote login SSH control	Support
Remote controller control	Support

Working environment

Charging temperature	0~45°C
Discharging temperature	-10~60°C
Working moisture	30%~70%

Port

Power port	12V
Hardware port	LAN*1, WAN*1, VGA*1 USB3.0*2、USB2.0*1

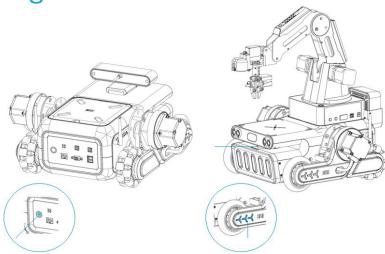
Openness

All algorithms are open source	Support
Android secondary development DEMO	Support

5. Quick Start 1 – Map building navigation

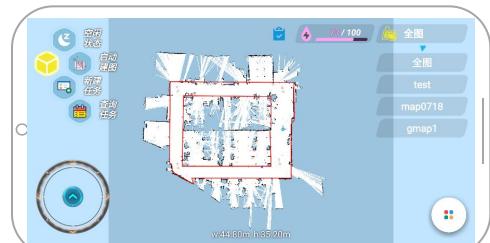
▷ Step 1: Start LEO

Press LEO power switch. After the blue lights located on both sides are illuminated and wait for 1~2 minutes until the ladar keeps running, LEO is ready.



▷ Step 2: Connect LEO

After a mobile/tablet connects LEO's wifi (Some Android 9.0+ mobiles/tablets connect to wifi and then a prompt will ask if using the network or not. Please select yes), please run RosCore App. After logging in, the connection is successful if the power on the main interface is displayed normally.



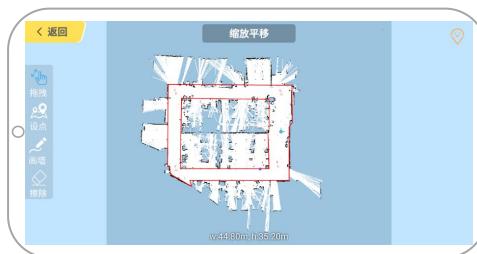
▷ Step 3: Slam map building

Click the main interface of RosCore to build the map and use the remote control at the lower left to control LEO to walk around the area to be mapped. After the map image is basically displayed, click Save Map in the menu button in the lower right corner and wait a few seconds, the map is saved.



▷ Step 4: Create a task

In the main interface of RosCore, click the map list at the upper right corner and select a previously created map to calibrate the location, add some target points, and create a corresponding navigation task.



▷ Step 5: Slam navigation

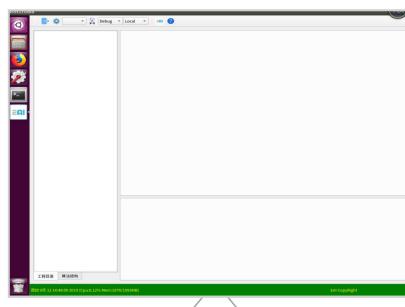
Click query task in the main interface of RosCore, and then click the executing task of the corresponding task. The navigation task will start to execute in a loop.



6. Quick start 2 – RosStudio

▷ Step 1: Run RosStudio

After RosStudio software is installed, run the command: `./RosStudio.sh` in the home directory (`~/RosStudio`) of the program. This software is successfully installed if the main interface can be entered after startup, as shown below:



WiFi Step 2: Configure to connect LEO robot

Firstly make sure ROSrobot is turned on. Then connect PC's WIFI to this ROS robot. Click RosWinodws main interface's icon to enter the robot's connection configuration interface. The robot's connection configuration interface is shown below. Then, click "Add" after entering the robot configuration information. In the end, click "Source code download" to download the source code from the LEO robot to this computer.

⚠ Note 1: Remarks can only be unique

⚠ Note 2: LEO robot's default name is EAI_LEO.

⚠ Note 3: When adding LEOrobot's configuration information, it needs to input the local root account password.



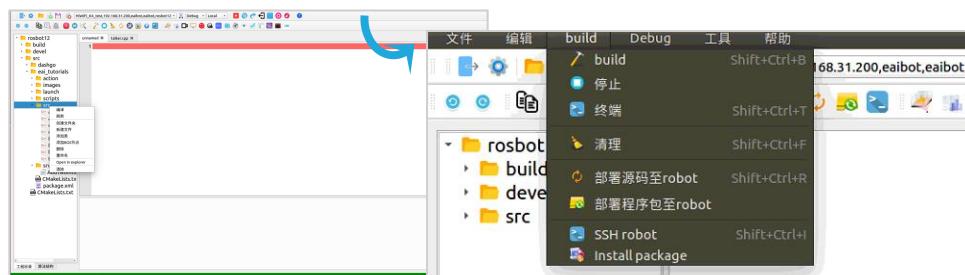
Cloud Step 3: Compiling and deploying

After downloading the source code, the project of the source code is displayed on the left, the source code editing area on the upper right, and the information output area on the lower right, as shown below.

Click the "build" function in the build menu to start compiling the project.

(Compiling parameter switch: Debug / Release is for optional. The executable programs generated by the Debug mode contains the gdb debugging information. There is none in the Release mode. Local / Remote is for optional. Local refers to the host and Remote refers to the currently selected robot.)

The executable program package compiled on the host can be deployed to the target robot by clicking the "Deploy Program Package to Robot" function in the build menu.



Step 4: Debug program

After compiling successfully, open the program to be debugged and set a breakpoint at the program entry. Click the "Start debugging" function in the Debug menu to enter the debug mode.

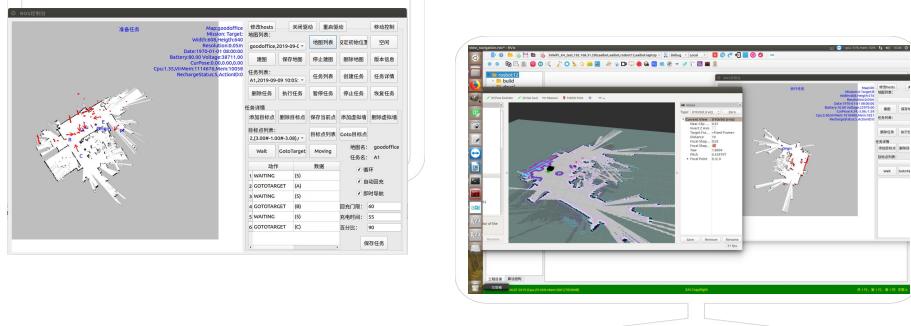


Step 5: ROS console and plugin

The main functions of the ROS console are: controlling ROS robot's movement, building maps, navigating, executing tasks (navigating to the target point), and drive control.

The console is used to control the robot to load the map, view the laser data, and view the robot internal algorithm's running process in real time.

The various situations of the target robot can be viewed by combining plugins under the tools menu.



7. After sales terms

🛡 Warranty

- The warranty period of this product is one year from the date of receiving the goods. When signing for the receipt of goods, please confirm the integrity of the packaging. The company will not be held responsible for the problems caused by transportation.
- After unpacking, please check the goods according to the shipping list. If the goods are damaged or incomplete, please contact the local agent, call the customer service hotline (+86-075586953040) or contact us by email (eai@eaibot.com) at the first time.
- If within seven days after a user purchasing the goods (counting from the date of receiving the goods, the seventh day included), a non-human performance failure of the products or accessories occurs. Please contact the customer for confirmation. If the product problem cannot be resolved, you can apply for repair or replacement of the product, and the seller will bear the postage; otherwise, it will be deemed invalid.

⚠ Note: The replacement or return freight that meets the above conditions shall be borne by the local agent (the freight in the mainland is borne by Yuedeng Technology). If the destination tariff is required to be paid due to the policies of various countries, the customer shall bear it.

🛠 Free Maintenance

During the warranty period and being in line with the free maintenance terms, free maintenance services are provided to customers in case that the product has a non-human performance failure.

The implementation of free maintenance services must meet the following conditions:

- The products that are normally used within the specified product warranty period since being purchased and have non-human performance failures.
- There are no unauthorized repair, modification, disassembly or installation and other non-human performance faults.
- The valid proof of purchase, invoice and invoice number are provided.

The following situations are not the cases of free product maintenance:

- Damage caused by unauthorized repair, modification, disassembly, unpacking, etc.
- Damage caused by reliability and compatibility issues when used with third-party components not certified by the company.

⌚ Paid Maintenance

- If the failure of the product is caused by the user or other force majeure factors and the parts can be replaced by the user, the user will be provided with a quotation for the parts according to after-sales maintenance charge standard of Shenzhen Yuedeng Technology Co., Ltd. If the user accepts the quotation, the spare parts can be directly sent to the user after paying the relevant expenses, and the replacement guidance shall be provided.
- If the faulty product needs to be sent back to the agency for maintenance, the technician shall judge whether the product fault can be repaired and solved, and shall inform the user of the relevant maintenance cost in advance; if the user accepts the quotation, after paying the relevant cost, the product shall be repaired, tested and sent back, and the round-trip freight shall be borne by the user.

The following situations fall into the scope of paid maintenance services:

- Exceeding the valid warranty period of the product
- All the cases that do not belong to free maintenance (Refer to the cases that do not belong to free maintenance in normal free maintenance for details)

❓ Special Note

- This warranty is only applicable to customers in mainland China who purchased the goods from the official website. Other warranty and support are provided by local agents.
- If there is any problem that cannot be solved, please contact the official after-sales service in time. We will timely provide the solution for solving the problem.

FCC WARNING:

- Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radiofrequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- -Reorient or relocate the receiving antenna.
- -Increase the separation between the equipment and receiver.
- -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- -Consult the dealer or an experienced radio/TV technician for help.

Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body:
Use only the supplied antenna

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For more information, please visit www.eaibot.com

