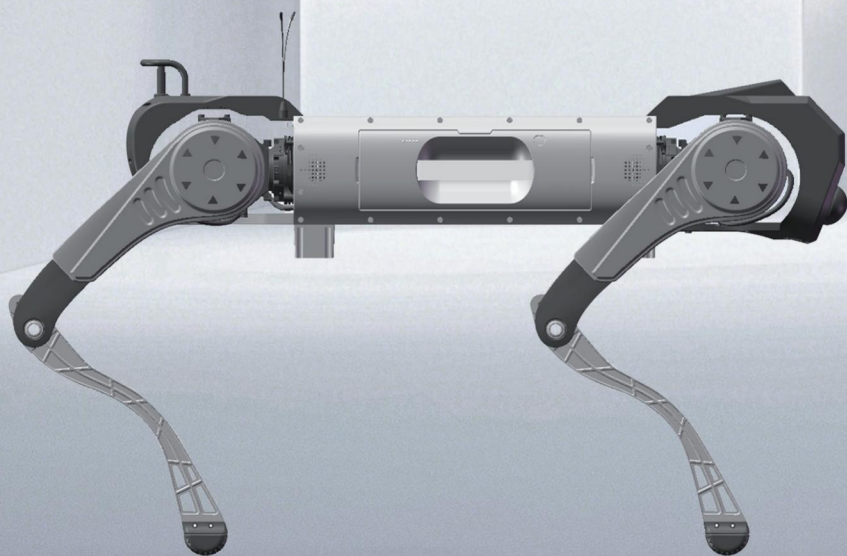


AGIBOT D1 MaxPro

User Manual



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Legal Statement

Before using this product, users must carefully read this product manual and strictly follow the instructions contained herein. This product is strictly prohibited from carrying people. Under no circumstances should it be ridden or used to transport personnel. The company assumes no responsibility for any property damage or personal injury resulting from failure to comply with the instructions in this manual. This product consists of multiple components. Ensure that children cannot access the product to avoid accidents. This product is to be used only by persons aged 18 years or older. To extend the service life of the product, do not use it in high-temperature or high-pressure environments. This manual contains product functions and usage instructions to the greatest extent possible. However, due to ongoing functional enhancements and design changes, there may be discrepancies between the actual product and the manual. In the event of any differences in color, appearance, or other aspects between the actual product and the manual, the actual product shall prevail.

Product Overview

The AgiBot D1 MaxPro (Product model ZYCXD150M) is an industrial-grade quadruped robotic chassis. Each leg is equipped with three motors, totaling 12 degrees of freedom, enabling locomotion such as walking, trotting, stair climbing, and trench crossing. The main features of this product include high payload capacity, long endurance, and strong adaptability to complex terrains.

A. Payload Capacity:

Designed for heavy-load applications, supporting a continuous flat-terrain load of up to 50 kg (excluding atypical scenarios such as stair climbing, rubble environments, and steep ladders), and a standing load of up to 100 kg. Compared with the previous generation, the payload capability has been increased by 2.5 times, meeting the demands of heavy-duty scenarios such as material transport and industrial handling.

B. Autonomous Patrol and Environmental Perception:

The robot can perform autonomous patrol functions using LiDAR. It also integrates a rich set of sensors including LiDAR, a head-mounted camera, IMU, and GPS, enabling comprehensive environmental perception in complex environments, enabling map construction and path planning. The system is adaptable to various applications such as public security patrols, water utility inspection, and petroleum pipeline inspection.

C. Motion Performance:

The robot offers outstanding mobility. It can smoothly ascend and descend 45° staircases, stably climb open-frame industrial stairs, and overcome obstacles up to 30 cm high. The self-righting mechanism is highly reliable, allowing the robot to recover from a fall within 20 seconds, ensuring quick resumption of operations under complex terrain or unexpected conditions. With a no-load speed of 2.5 m/s (3.5 m/s for the high-speed version), it can rapidly respond to emergent tasks, operating efficiently in complex or restricted environments.

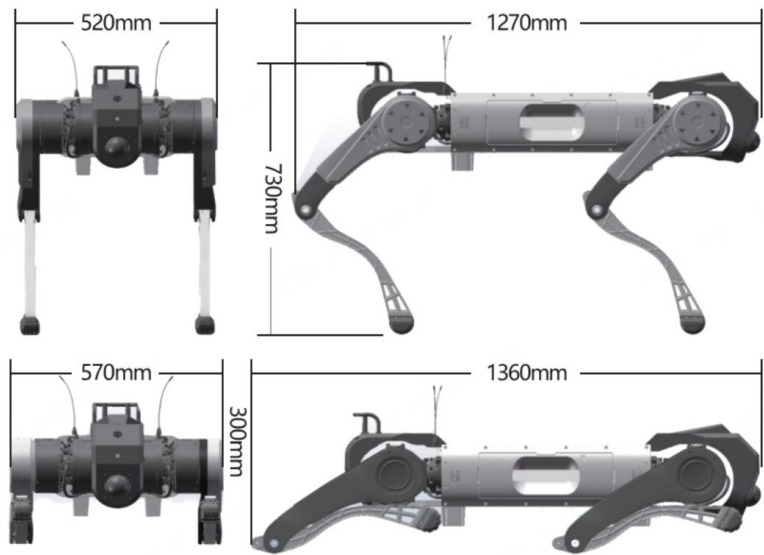
D. Environmental Adaptability:

With an IP67 industrial-grade protection rating, the robot functions reliably in ambient temperatures ranging from -20°C to 55°C and can operate in water up to 30 cm deep. It is designed to withstand extreme cold, heat, rain, and other harsh conditions, ensuring stable performance in diverse and demanding environments.

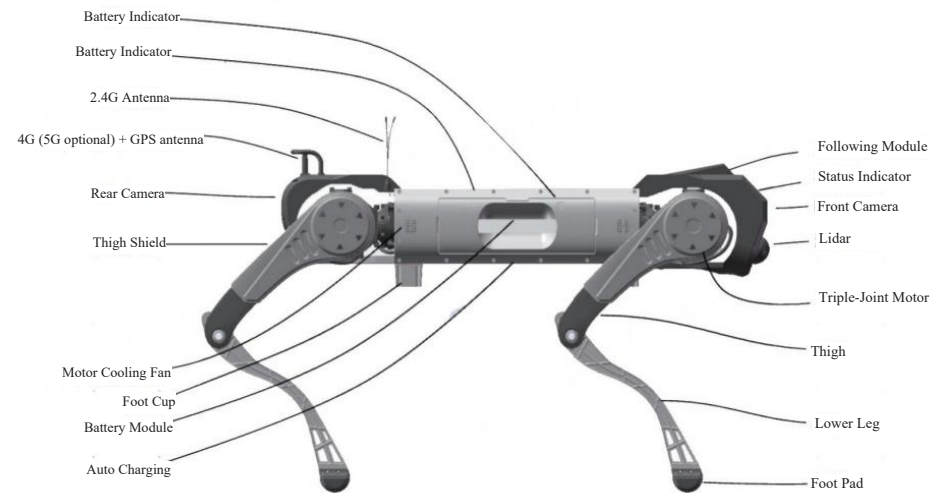
E. Endurance Assurance:

The 2123 Wh battery pack provides 28% longer endurance under load, and supports rapid field replacement, ensuring uninterrupted power supply for special missions and critical industry applications. This design significantly reduces downtime and improves operational efficiency.

Product Dimensions



Product Details



Product Parameters

Category	Specification	Description
Basic Information	Material	Aluminum alloy with high-strength engineering plastic
	Standing Dimensions (L × W × H)	1270mm × 520mm × 730mm
	Prone Dimensions (L× W × H)	1360mm × 570mm × 300mm
	Total Weight (with battery)	68 ± 1kg
	Degree of Freedom	Entire machine: 12, Each leg: 3
	Operating Temperature	-20°C ~55°C
	Ingress Protection Rating	IP67
	Computing Modules	117 TOPS GPU, ARM CPU
	Battery	Battery capacity: 2160Wh, rated capacity: 45±1Ah, voltage: 48V ± 2V
	Charging Duration	about 4.5h (Battery level: 10%~90%)
	Battery Life ⁽¹⁾	5.5h at no-load, 2h loaded with 50kg
	Operating Range	21±1km at no load, 11±1km at full load
Performance Parameters	Continuous walking speed	0-1.2m/s
	Maximum Speed ⁽²⁾	3m/s
	Rated Payload	50kg
	Continuous Stair-Climbing Height	30cm
	Maximum Climbing Angle	45°
Overall Joint Parameters	Maximum Joint Torque	Maximum torque: 300 N·m; software- limited torque: 180 N·m
	Joint Range of Motion (Body)	-45°~45°
	Joint Range of Motion (Thigh)	-200°~20°
	Joint Range of Motion (Calf)	30°~160°

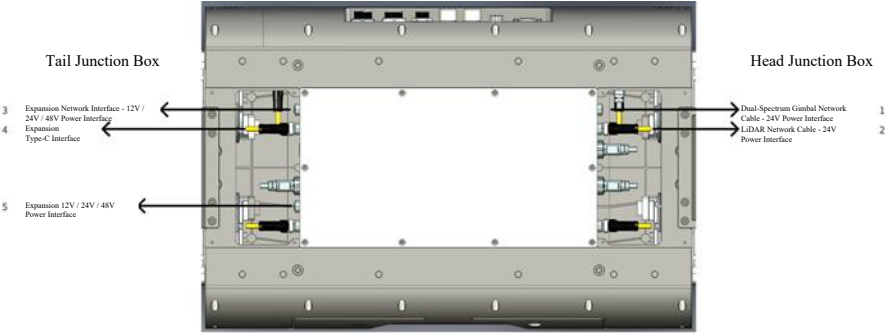
Product Parameters

Category	Specification	Description
Sensors	Lidar	One front-mounted 96-line LiDAR with a 360° × 90° coverage angle, 120m detection range, and 1.5cm accuracy
	Wide-Angle Camera	One industrial-grade 2MP wide-angle camera at the front and one at the rear; field of view: DFOV 150°, HFOV 130°, VFOV 73°, frame rate: 30fps
	IMU	1, automotive grade
Function List	Standard Actions	Standing, lying down, damping, unloading; stair climbing and obstacle crossing
	Real-Time Image Transmission	Supported
	Secondary Development	The SDK currently supports communication via TCP and ROS protocols, offering SDK packages for both x86 and ARM architectures
	Communication Features	Supports WiFi 6.0, Wi-Fi frequency band is 2.4 GHz, Wi-Fi transmission power is 72 dBm. Supports Bluetooth 5.2, with optional 4G module
	Functional Expansion Ports	Communication interfaces: 2x USB 3.0, 3x Fast Ethernet (100Mbps), and serial port Power output interfaces: 12V, 24V, 48V; maximum output power 720W. Charging interface: supports direct battery plug-in charging
Accessories	Power Adapter	Standard
	Battery Charging Adapter	Standard
	Remote Control	Screen Remote Control, with manual emergency stop mode, Maximum remote control range: 500m
	Autonomous Charging Dock	Optional

Notes:

- (1) Due to differences in testing methods and operating environments, the actual battery life under no-load conditions is 5.5 hours ± 0.5 hours;
- (2) These figures were obtained from extreme testing conducted in a laboratory setting. For safety reasons, software limitations have been applied; the actual product is limited to a speed of 2 m/s;
- (3) The above parameters are based on laboratory test data; actual performance may vary depending on factors such as the operating environment and usage methods. Actual results may differ;
- (4) For instructions on using the expansion interfaces, please refer to the expansion manual;
- (5) For detailed warranty terms, please refer to the product warranty manual;

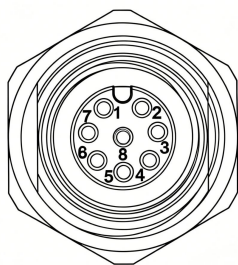
Rear Interface Layout Definition



Note: The rear interface consists of two main modules - the head communication junction box and the tail power junction box

No.	Interface	Interface Type	Mating Connector Type	Quantity	Function
1	Dual-Spectrum Gimbal Interface	M12A-8P Female	M12A-8P Male	1	Connects to head-mounted dual-spectrum gimbal communication; 12V and 24V/1.5A power
2	LiDAR Interface	M12A-8P Female	M12A-8P Male	1	Connects to upper-mounted LiDAR communication; 24V/2A power supply
3	Expansion Network Interface	M12A-17P Female	M12A-17P Male	1	Connects to expansion network cable; 12V, 24V, 48V/1.5A power
4	Expansion Type-C Interface	Type-C Waterproof Socket	USB Type- C	1	Expansion USB 3.1 interface, 10Gbps
5	12V, 24V, 48V/15A Power Interface	M12K Female	M12K Male	1	Provides power to upper-mounted equipment; 12V, 24V, 48V/10A output

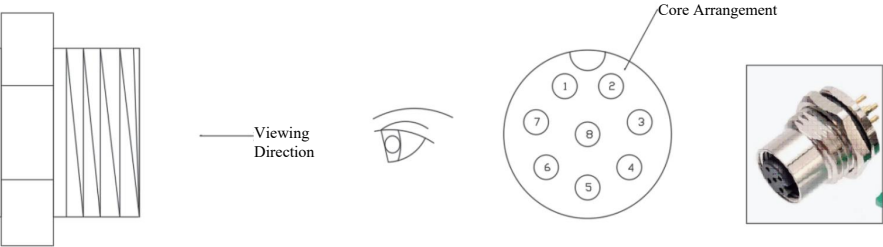
Head Junction Box — M12A-8P Female Aviation Connector
Dual-Spectrum Gimbal Network CablePin Definition



M12A Female Pin No.	Definition	RJ45 Pin No.	Current	Function
1	24V +		2A	24V Power Positive
2	RX+	1		Data Receive Positive
3	RX-	2		Data Receive Negative
4	TX+	3		Data Transmit Positive
5	TX-	6		Data Transmit Negative
6	NC			
7	NC			
8	24V -			24V Power Negative

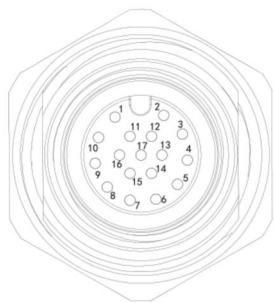
Head Junction Box - M12A-8P Female Aviation Connector

LiDAR Network Cable Pin Definition



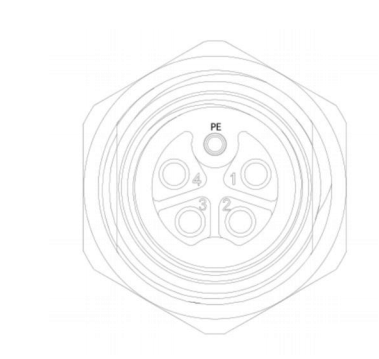
M12A Female Pin No.	Definition	RJ45 Pin No.	Current	Function
1	24V +		2A	24V Power Positive
2	RX+	1		Data Receive Positive
3	RX-	2		Data Receive Negative
4	TX+	3		Data Transmit Positive
5	TX-	6		Data Transmit Negative
6	NC			
7	NC			
8	24V -			24V Power Negative

Tail Junction Box — M12A-17P Female Aviation Connector Pin Definition



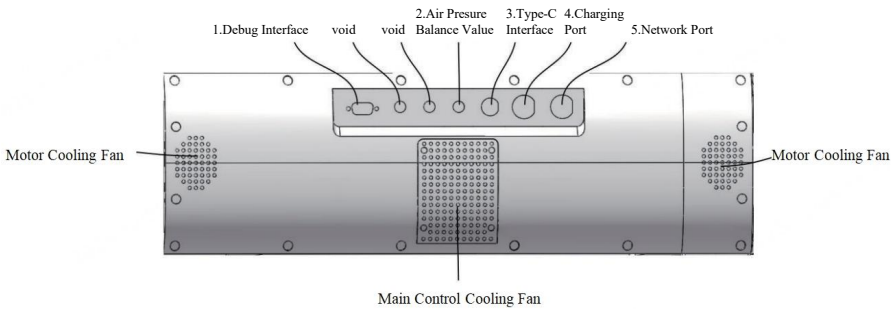
M12A Female Pin No.	Definition	RJ45 Pin No.	Current	Function
1	48V +		1.5A	48V Power Positive
2	RX+	1		Data Receive Positive
3	RX-	2		Data Receive Negative
4	TX+	3		Data Transmit Positive
5	TX-	6		Data Transmit Negative
6	12V +			12V Power Positive
7	12V -			12V Power Negative
8	12V +			12V Power Positive
9	12V -			12V Power Negative
10	24V +			24V Power Positive
11	24V -			24V Power Negative
12	24V +			24V Power Positive
13	24V -			24V Power Negative
14	48V +			48V Power Positive
15	48V -			48V Power Negative
16	48V +			48V Power Positive
17	48V -			48V Power Negative

Tail Power M12K Interface Definition



M12A Female Pin No.	Definition	Current	Function
1	48V +	10A	48V Power Positive
2	48V -		48V Power Negative
3	24V +		24V Power Positive
4	12/24V -		24V Power Negative
PE	12V +		12V Power Positive

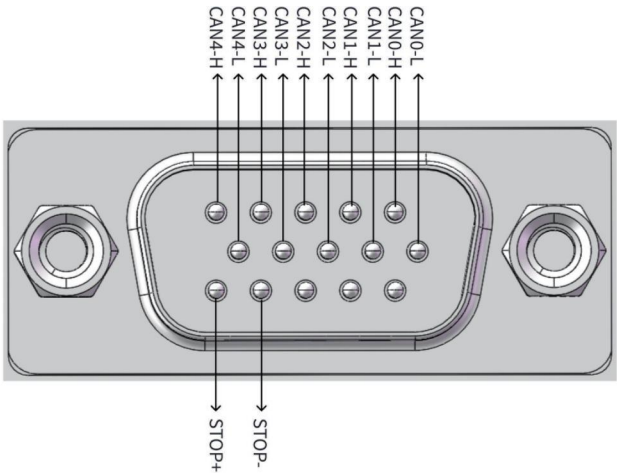
Left-Side Interface Layout Definition



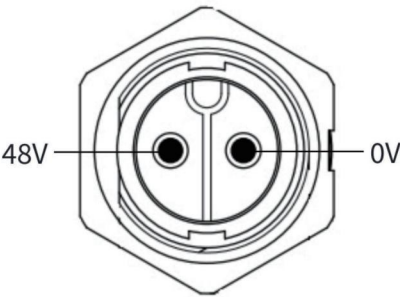
No.	Device Name	Model	Quantity	Function
1	Debug Interface	DB15 Female	1	Motor CAN diagnosis, Battery CAN diagnosis, Debug Emergency Stop
2	Air Pressure Balance Valve	M12	1	Balances internal and external air pressure
3	Type-C Interface	E10T-FT3-PWF / MT3-NWA-xxFPC	1	Type-C interface communication with main control board
4	Charging Port	E13T-P2B-PPF-01		48V charging port
5	Network Port	E13T-FR5-PRF-180		100M Ethernet port / Debug network port

Note: If you need the Wi-Fi firmware update, please visit <https://www.agibot.com.cn/> and download the D1 MaxPro documentation from the open-source section of AGIBOT official website.

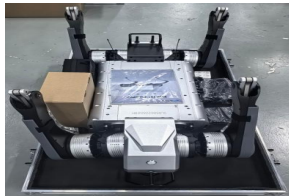
Debug Port Interface Definition



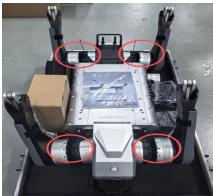
Charging Port Interface Definition



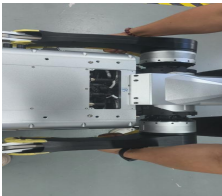
Unboxing



Open the flight case.



Take out the accessories, move joints as shown. 4 people: lift by joints out of flight case.



Two people can carry out the airline crate as shown in the diagram.

Power On

Press and hold the battery power switch as shown below. During the startup process, the LED indicators will light sequentially from right to left (starting from red to green). When all LED lights are fully illuminated, release the button. At this point, the battery discharge function is activated, and once the main control board receives power, the system automatically powers on.



After approximately 55 seconds, the indicator light turns green, indicating that the quadruped robot is now in a controllable state. The first-time SSH login requires mandatory password modification. Wireless SSH is unavailable until the password is changed.

Indicator Light



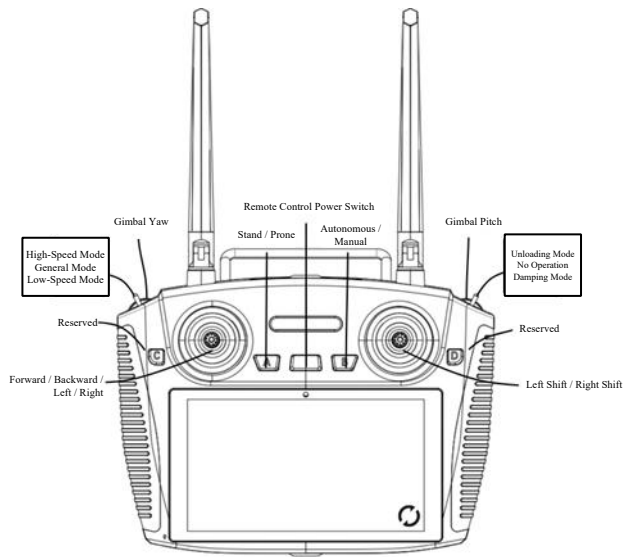
Power Off

Before powering off, ensure that the quadruped robot is in the prone position. Press and hold the power button; during this process, the LED indicators will turn off sequentially from left to right (starting from green to red). Once all LEDs on the battery are completely off, the robot enters the shutdown state. To restart, perform the preparation and power-on procedures again.



Controller Layout and Operation

Note: The quadruped robot cannot be operated while the remote controller is charging!



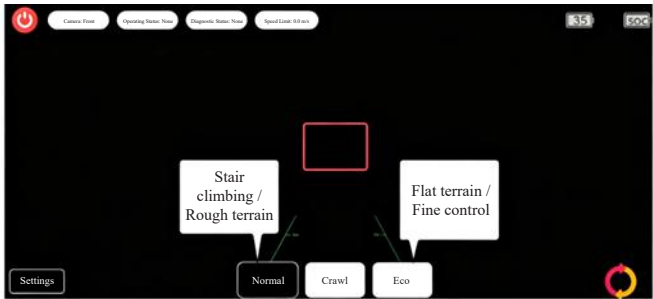
Notes: The Yaw and Pitch functions of the gimbal require the installation of an additional gimbal mount.

Action State	Model	Function
Standing	Button A	During the first startup, press the button 2 times continuously to make the robot stand up. In standby mode, press once continuously to enter standing posture
Prone	Button A	While in the standing posture, press once to make the robot lie down.
Damping	Right Toggle Switch to Right Position	In any state, toggle to this position to enter Damping Mode.
Unload	Right Toggle Switch to Left Position	Switch to Damping Mode first, then toggle to this position to enter Unloading Mode.

Control Mode	Operation Mode	Requirements
Low-Speed Mode	Left toggle switch to left position	Control mode must be set to low-speed mode Action status must be standing and stationary
Medium-Speed Mode	Left toggle switch in the middle position	Control mode must be set to medium-speed mode Action status must be standing and stationary
High-Speed Mode	Left toggle switch to the right position	Control mode must be set to high-speed mode Action status must be standing and stationary

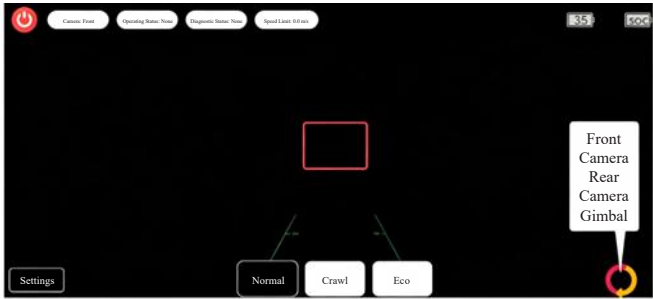
Special Function	Operation Mode	Requirements
Normal Mode (for stair climbing, obstacle crossing)	Touch button on the screen	Control mode must be set to normal mode Action status must be standing and stationary
Posture Adjustment (for internal engineering use)	Touch button on the screen	Control mode must be set to normal mode or high-speed mode Action status must be standing and stationary

Posture Adjustment / Energy Saving / Normal Mode: Tap on screen — highlighted indicates selected state



Screen Display — Front/Rear Camera Switching Operation

In the front camera display interface, tap the screen cycle button to switch to the rear camera view



System Password Management

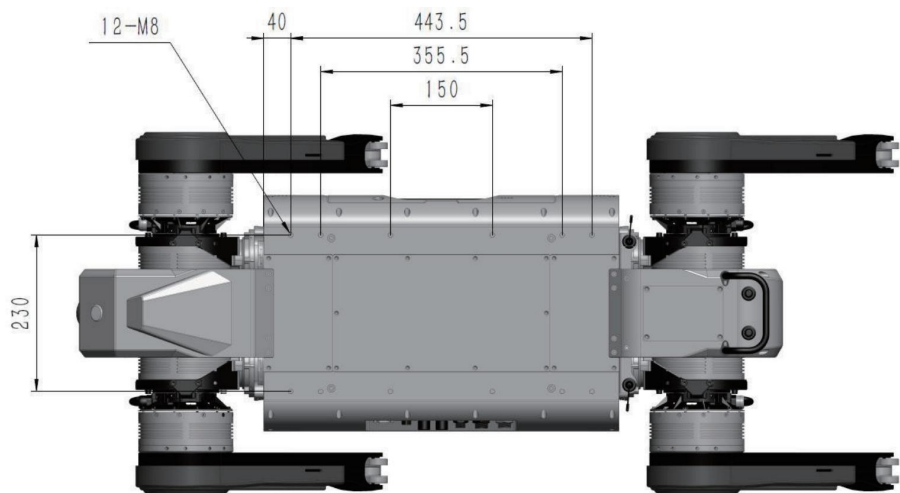
- 1. Robot System Password: When logging in via SSH for the first time, use the default password User12345!. Password modification is mandatory and cannot be skipped. SSH will not work until a new password is set. Password requirement: 12- 16 characters, must include uppercase letters, lowercase letters, numbers and special symbols.
- 2. Remote Controller Lock PIN: You will be prompted to set a PIN on first use. If skipped, you may modify it later via 【Settings- Security】 . Only 6- digit numbers are supported. Consecutive wrong inputs will trigger lockout.

Indicator Light Status

No.	Indicator Light	Indication
1	Solid Green	Controllable state
2	Solid Blue	Battery SOC below 20%, or motor overheating / warning / anomaly
3	Solid Red	Battery SOC below 5%, or motor fault
4	Off	Circuit malfunction

The quadruped robot features adaptive payload functionality, supporting a load range of 0– 50kg. Operation Procedure: When installing a payload, ensure the robot is in the prone position. Securely mount and fasten the payload, then switch the robot to the standing position. The robot will automatically detect the payload weight, completing the identification process after approximately 3 seconds, after which normal operation can continue.

The robot chassis is equipped with predefined screw holes. Users can design and install custom fixtures based on these screw holes to mount upper-level devices.



If any joint swinging or striking occurs during operation, immediately activate the Damping Mode (move toggle switch F to the right). The Damping Mode helps reduce joint damage that may occur due to a fall or impact.

Power Adapter Introduction

Input Parameters	AC 100-240V
Output Parameters	DC 54.6 V
Charging Current	10A

The charger is equipped with two LED indicators (LED1 and LED2): When the charger is connected to power plug, LED1 lights red. When connected to the charging port, LED2 lights red during charging. When fully charged or not charging, LED2 lights green. The charger light statuses are as follows:

No.	Status	Description
1	Normal Charging	Cooling fan activated; LED1 Red, LED2 Red
2	Fully Charged or Not Charging	Cooling fan off; LED1 Red, LED2 Green



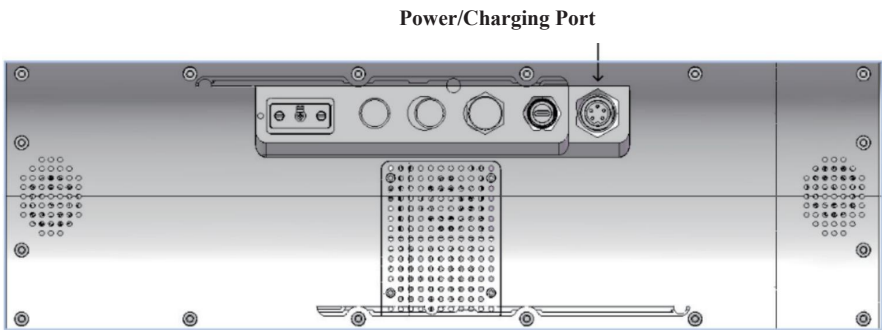
Charging in Progress



Charging Completed

Charging

The quadruped robot is charged via direct plug-in charging and uses a ternary lithium battery. Use the supplied charger, which has a three-pin plug (for connection to the power plug) and a two-pin plug (for connection to the robot's charging port). The charging port is located on the left side of the body, as shown below. Once the charger is connected to the charging port, the electrical system automatically powers on, which is normal behavior. During charging, the remote controller cannot control the robot.



Checking Battery Level

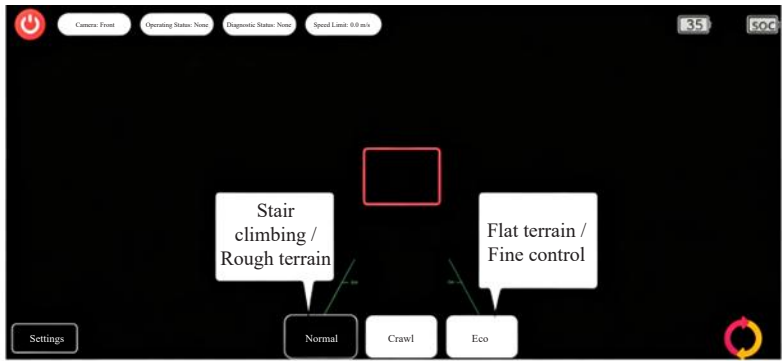
Press the battery power button once manually — the LED indicators will display the remaining battery level. There are five LED lights, and each light represents 20% of total battery capacity.



Charging Precautions

- Ensure the quadruped robot is powered off before charging.
- Connect the battery charging port first, and then plug in power plug.

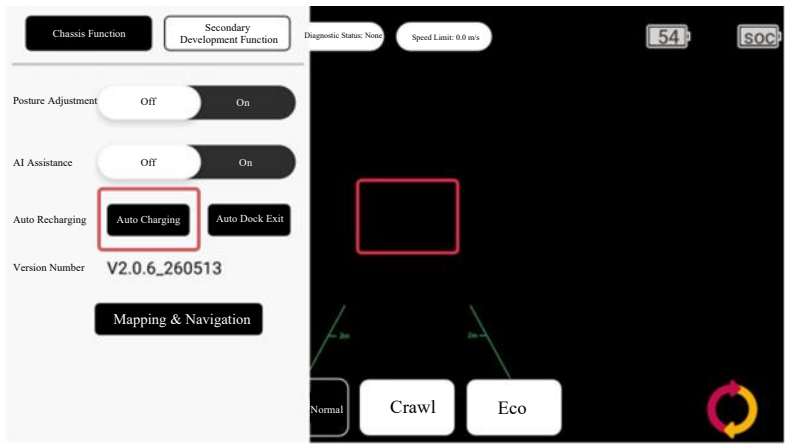
Terrain Mode Switching



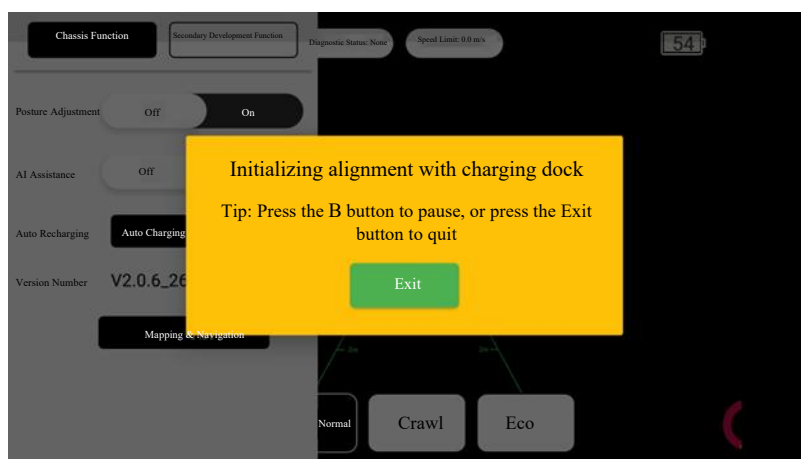
Scenario	Precautions
Adding Payload	The robot features a mass estimation function. When adding payload, ensure the robot is in the prone position.
Sloped Terrain	Slope gradient should not exceed 45°. Use normal mode for both ascending and descending slopes
Grassland / Sandy Terrain	Normal Mode is recommended. Walk slowly on special terrain surfaces.
Stairs / Steps	The height of each individual stair step should not exceed 30 cm, and the overall angle of the staircase should not exceed 45°. When using the robot to climb up or down stairs or steps, use Normal Mode . After climbing stairs or steps and transitioning to flat terrain, use Eco Mode for flat-ground walking.

An optional charging dock is required. When the head of the robot dog is facing the charging dock and the distance between them is 0.5 to 1 meter, follow the steps below:

A. Tap the Auto Recharging button on the screen — the button will be highlighted to indicate selection;



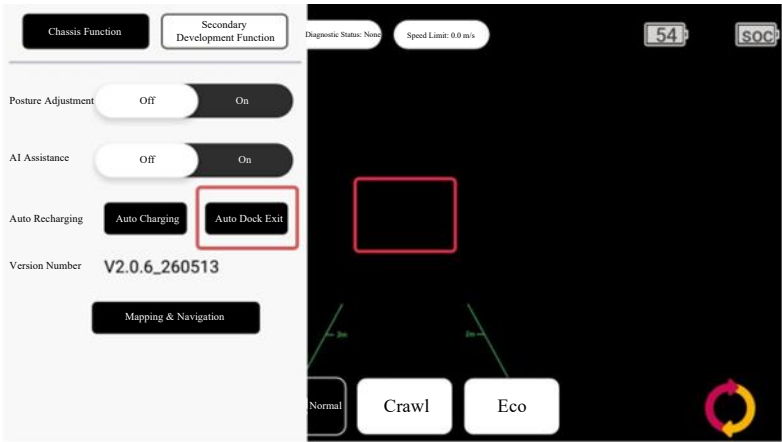
B. Press the B button on the remote controller to initiate the auto recharging function;



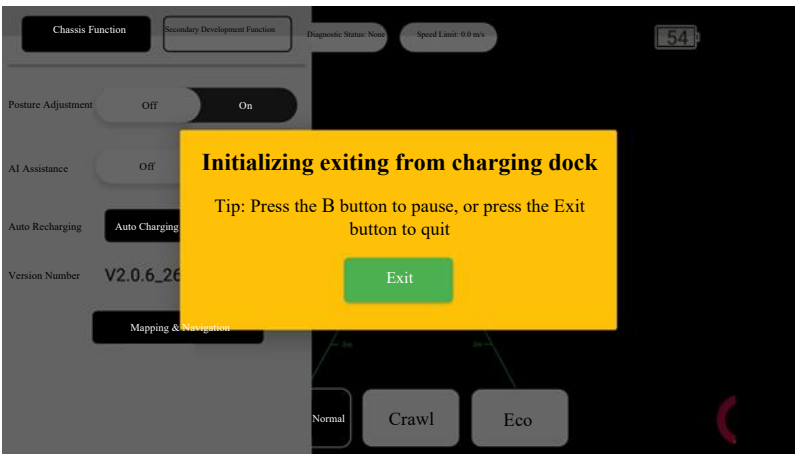
C. The robot will begin autonomous recharging.

After charging is completed, follow these steps:

a. Tap the Auto Dock Exit button on the screen — the button will be highlighted to indicate selection;



b. Press the B button on the remote controller to deactivate the auto recharging function;



c. The robot deactivates the auto recharging function;

d. The robot can now be operated normally via remote controller.

- The SDK currently supports the following functions:
- Basic Actions: Standing, Prone
- Motion Control: Forward / backward / lateral movement, upward / downward rotation (fixed), stop motion, set velocity to zero, continuous movement, move specified distance forward / backward, move specified distance laterally, end motion command
- Special Modes: Zero Torque Mode, Damping Mode, Parameter Adjustment Mode
- State Acquisition: Motion state, velocity, tilt angle, body height, lateral and longitudinal displacement, robot status, velocity and angular velocity along X/Y/Z axes, SDK version number
- Parameter Settings: Body height, velocity

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**To Become a Global
Leader in Intelligent
Robotics and
Pioneer a Universal
Robotics Ecosystem**

”



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