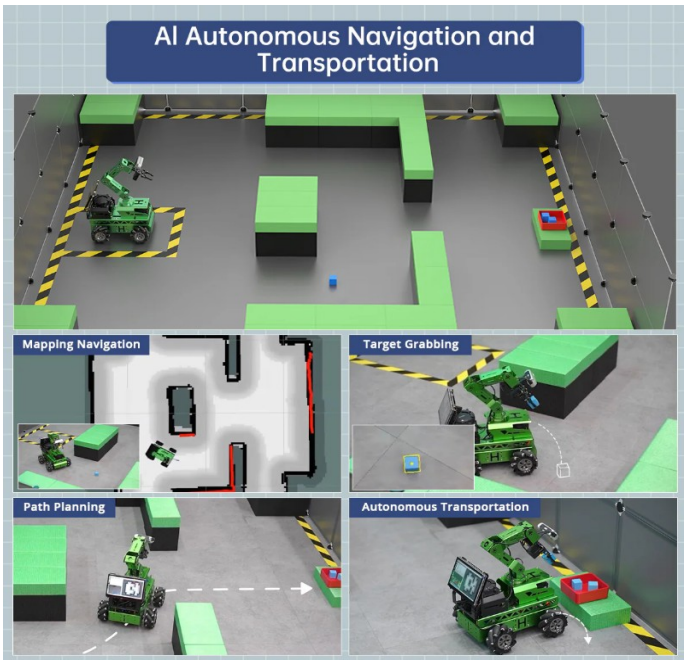
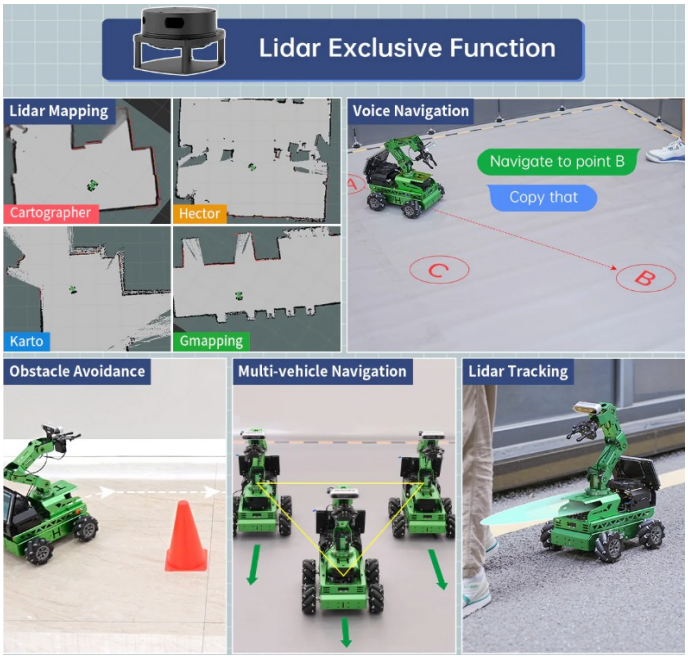
RoboMaster EP Expansion vs Mecanum JetRover Developer Kit

Produto	**RoboMaster EP Expansion**	**JetRover Developer Kit by Jetson**
Fabricante	DJI (China)	HiWonder (China)
Estado do Produto:	**Descontinuado**	Em comercialização
Gama	Educacional	Educacional / Investigação
Deteção max. obstáculos	10m (120°)	12m (360°)
Extensão 1	Braço de 2 eixos, alcance máximo 22cm	Braço de 6 eixos, alcance máximo 43cm
Extensão 2	Canhão	Não
Garra	Sim, associada ao braço	Sim, associada ao braço
Câmera	Profundidade (depth)	Profundidade (depth)
Localização via:	Infravermelhos ToF 20°	LIDAR 360°
Peso	3,3kg	4,7kg
Dimensões	320×240×270 mm	324x260x275mm (659mm c/ braço na vertical)
Bateria	2400mAh 3S	6000mAh 3S
estrutura	metálica	metálica
Tipo de rodas	mecanum	mecanum
Quantidade de controladores	1	2
Controlador Principal	Jetson Nano 4GB	Jetson Nano 4GB (master)
Controlador Secundário	não	STM32 (slave, controlo baixo nível)
Programming Support	Python, Scratch, ROS	Python, C/ C++/ JavaScript, ROS
App	iOS e Android	iOS e Android
Coluna	sim	Sim, 5W
Microfone	Sim, simples	Sim, do tipo array
Display	Não	Sim, display touch 7” HDMI
HUB USB	Não	Sim
IMU	Não	Sim
Comando controlo remoto	Não	Sim

Mecanum JetRover Robot Car Developer Kit Camera, Lidar, Display and microphone by Jetson Nano

https://www.hiwonder.com/products/jetrover?variant=41198998093911

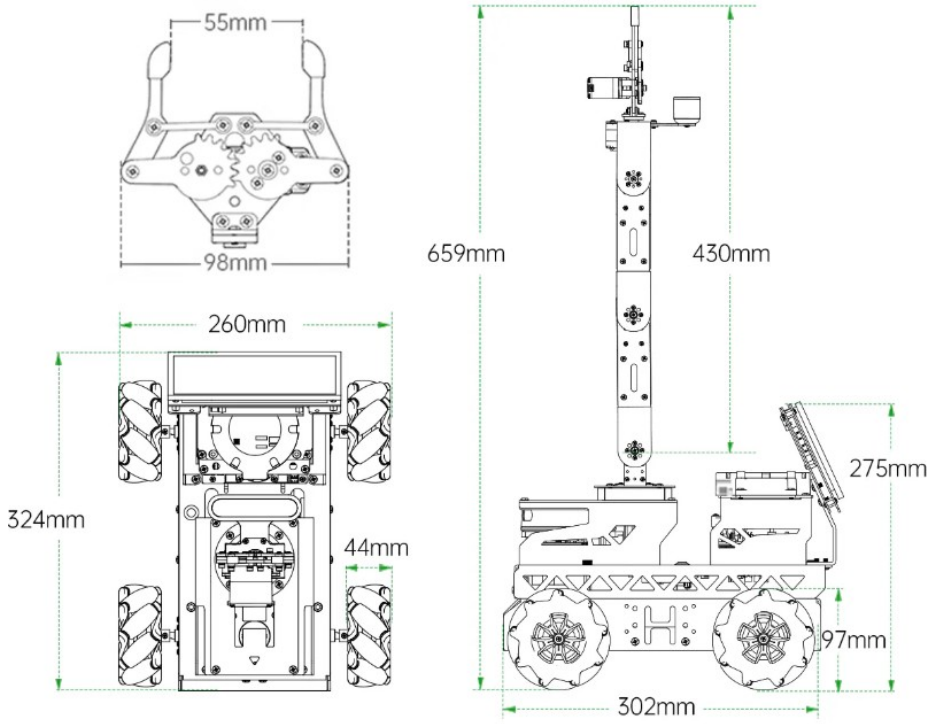

AI Autonomous Navigation and Transportation
Mapping Navigation
Target Grabbing
Path Planning
Autonomous Transportation


Lidar Exclusive Function
Lidar Mapping
Cartographer
Hector
Karto
Gmapping
Voice Navigation
Navigate to point B
Copy that
Obstacle Avoidance
Multi-vehicle Navigation
Lidar Tracking

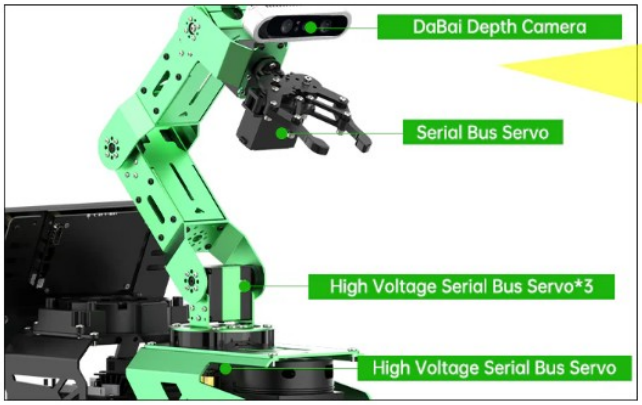

Far-field Microphone Array Exclusive Function
Far-field Microphone Array
Sound Source Localization
Hello, Hiwonder
I'm here
Voice Line Following
Hiwonder, track the yellow line.
Copy that
Voice Navigation
Navigate to point A
Copy that


3D Depth Camera Exclusive Function
RTAB-VSLAM 3D Mapping and Navigation
Depth Map Data, Point Cloud
KCF Target Tracking
Augmented Reality (AR)
Road Sign Detection
MediaPipe Development


WonderAi APP
Wireless Handle



① Vision Robot Arm and Serial Bus Servo



DaBai Depth Camera

DaBai depth camera is based on binocular imaging technology, which can provide high-precision depth images within 0.2 - 2.5m, and supports multi-platform applications such as Raspberry Pi/JETSON/Windows PC.

② SLAMTEC A1

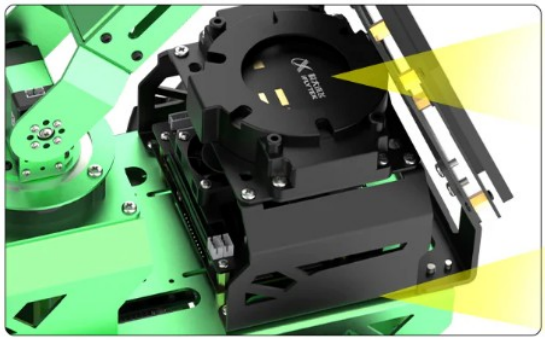
SLAMTEC A1 Lidar

Reliable performance, adjustable frequency, and excellent value.

SLAMTEC A1

③ Far-field Microphone Array

The microphone array is adroit at far-field sound source localization, voice recognition and voice interaction. In comparison to ordinary microphone module, it can implement more advanced functions.



Sound Card

Speaker

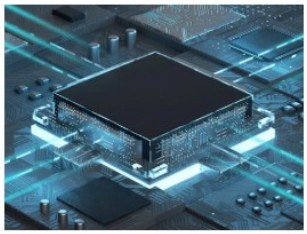
Far-field Microphone Array

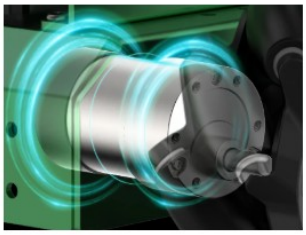
Compared with ordinary speech recognition modules, microphone arrays can achieve more advanced functions.

Built-in 5W stereo sound

Volume and sound effects are not comparable to toy-level small speakers.

④ Encoder Geared Motor and Wheel





Wrapped Rear Tail Shell

It can effectively protect the PCB circuit and magnetic ring at the end of the motor from external influences, effectively improving the safety and service life of the motor.

Permanent Magnet Brushed Motor

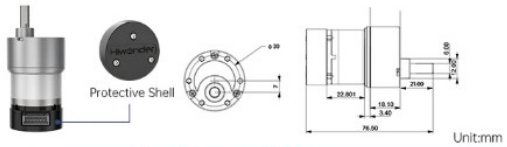
The permanent magnet DC motor has fast starting response speed, large starting torque and smooth speed change.

High-precision Magnetic Encoder

The motor is equipped with a high-precision magnetic encoder, has strong horsepower, high precision, and strong anti-interference ability.

Adapt to Various Scenes

The low speed of 1:90 ratio and the high torque of 15kg.cm enable the motor to adapt to car chassis made of various materials.



Unit:mm

Encoder Geared Motor			
Rated voltage	12V	Rated power	about 8.3W
Motor type	permanent magnet brushed	Stall current	3.2A
Stall torque	15kg.cm	Rated current	0.36A
Locked torque	2.6kg.cm	Gear ratio	1:90
No-Load speed	110rpm	Rated speed	85rpm
Shaft diameter	6mm (D-shaped shaft)	Encoder specification	AB Dual-Phase Encoder
Number of magnetic poles	11 poles	Port type	PH2.0-6PIN

Hall Encoder Geared Motor

520 motor comes with high-accuracy encoder, and features strong force and high performance. The built-in AB phase incremental Hall encoder stands out for its high accuracy and anti-interference ability.

Unit:mm

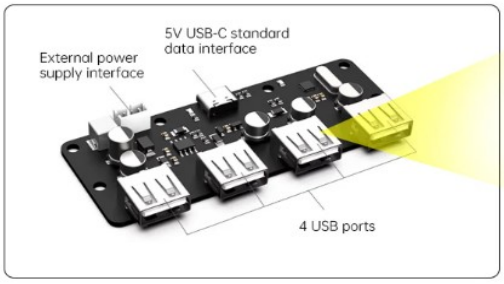
Mecanum Wheel			
Product	97mm hexagon coupling oversized	Number of rollers	9
Size	97mm	Weight	143g
Width	41mm	Support	0.36A
Hub material	ABS plastics	Gear ratio	Hexagon coupling 520 reduction motor
Roller material	TPE synthetic rubber	Applicable machine	Large sized: ordinary, racing robot car, Mecanum wheel car

Mecanum Wheel

The mecanum wheel has a compact structure and flexible movement, supports 360° all-round movement, and realizes the full lateral movement of the car.

⑤ USB HUB

The USB-HUB integrates a 5A high-current DC-DC power supply that converts one to four, solving the problem of insufficient ROS main control interfaces and insufficient power supply for high-power peripherals. Ultra-thin design, multiple layers can be stacked and cascaded without a



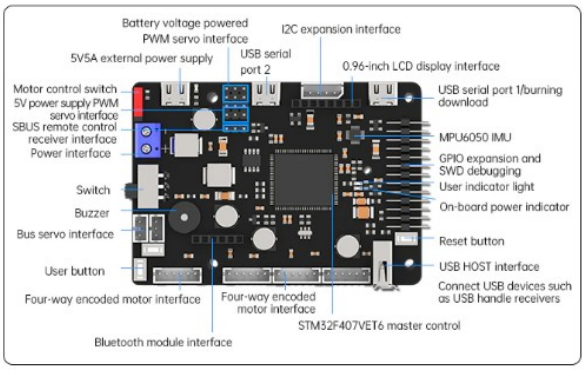
High Performance Control Chip

Built-in Overcurrent/ Overheat Protection

Parameters			
Weight	20.3g	Product size	86*37.8*9.5mm
Working voltage	5V	Transmission speed	480Mbps
Input interface	USB-C	Output interface	4*USB2.0 interface
External power supply voltage	9-24V	No-load operating current	1mA@12V

⑥ ROS Robot Control Board

The ROS robot control board uses the high-performance STM32F407VET6 main control chip and has built-in key configurations such as the important IMU attitude sensor.



ROS Robot Control Board			
Main control chip	STM32F407VET6 (100 pins)	Volume size	85*65mm
Switch	High-current toggle switch	Power input	Support 7-14V wide voltage
Motor interface	4-channel encoder motor	5V power supply	2 channels of independent 5V@5A power supply
Servo interface	4-channel PWM servo	Motor driver chip	YX4055 (overcurrent protection)
USB HOST	1 USB HOST interface, supports wireless controller, mouse, etc.	USB serial port	2-channel USB serial port (Type-C)
IMU sensor	3-axis acceleration, 3-axis gyroscope	SBUS interface	1 channel SBUS interface, supports SBUS model aircraft receiver
Color screen interface	1 channel 8-pin SPI color screen interface, supports multiple size color screens	Bluetooth interface	1 channel ttl Bluetooth interface
Protection circuit	Overheating, short circuit, overcurrent protection	I2C interface	1 channel 4Pin I2C interface

⑦ Lithium battery

The fuselage has a built-in 11.1V 6000mAh large-capacity lithium battery to improve the robot's endurance.

Parameters			
Battery model	11.1V6000mAh lithium battery	Battery voltage	11.1V
Battery capacity	6000mAh	Plug	DC5.5*2.5 female/ SM-2P male
Battery size	86*60*21mm	Charger	12.6V

Specification Parameters

Model	JetRover M1	JetRover A1	JetRover T1
Chassis type	Mecanum chassis	Ackerman chassis	Tank chassis
Size	324*260*659mm	325*261*657mm	345*246*660mm
Weight	4700g	5500g	4300g
Motor	voltage, position and temperature		
Encoder	1024-line AB phase high-precision quadrature encoder		
ROS controller	Raspberry Pi 5(8GB)/ Jetson Nano/ Jetson Orin Nano		
Control method	USB serial port, CAN port, Bluetooth app, remote controller		

USB expansion	USB HUB expansion board with 5A high current
Operating system	Ubuntu 18.04 LTS + ROS Melodic
Software	iOS/ Android app
Communication method	USB/ WiFi/ Ethernet
Programming language	Python/ C/ C++/ JavaScript
Servo type	HTS-20H/ HTS-21H/ HTD-35H/ HX-12H intelligent serial bus servo
Package weight	About 6.5kg
Package size	41*32*25cm

What Can You Learn?

A. Robot underlying function

01. Serial communication
02. Serial servo control
03. IMU and odometer data feedback
04. Battery voltage detection and alarm
05. Chassis kinematics analysis
06. Common circuit protection function

B. Mapping Navigation Functions

07. Robot dynamic obstacle avoidance
08. Robot point-to-point navigation
09. Robot multi-point navigation
10. TEB and DWA path planning
11. Lidar angle masking
12. Lidar mapping navigation
13. rtab vision-only mapping navigation
14. Rtab vision + Lidar mapping navigation
15. Gmapping mapping
16. Hector mapping
17. Karto mapping
18. Cartographer mapping
19. RRT autonomous mapping
20. Frontier autonomous mapping
21. Explore_Lite autonomous mapping
22. Robot formation (leader algorithm)

C. Human-machine interaction function

23. Handle control
24. Keyboard node control
25. APP gravity control
26. ROS APP image transmission and control
27. ROS APP mapping
28. ROS APP navigation
29. Sound source localization
30. Voice wake-up
31. Voice control
32. Voice-control navigation
33. Voice announcement
34. Voice interaction
35. Lidar following
36. Text to Speech

D. Vision processing functions

37. OpenCV application
38. Webcam monitoring
39. Depth vision tracking
40. KCF tracking
41. AR tag recognition
42. RGB vision line following (with Lidar obstacle avoidance fusion)
43. Human body recognition
44. Human body tracking
45. 3D vision mapping
46. 3D vision navigation

E. Deep learning function

47. YOLO object recognition
48. YOLO traffic sign recognition
49. Deep learning model training
50. Gesture control
51. Autonomous driving