

Intelligent Multi-functional Composite Robot with Body (CMR-D1 Pro)

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CMR-D1 Pro Multi-functional Embodied Intelligent Composite Robot, based on the upgraded DT-01 Pro S1 chassis, integrates a 6-axis collaborative robotic arm ($\pm 1\text{cm}$ repeatability) and a 1000mm vertical travel electric lifting platform, compatible with high-precision laser navigation ($\pm 2\sim 3\text{cm}$ positioning) and a 3D vision system. The chassis retains an 80kg load capacity and dual obstacle avoidance protection (laser + anti-collision strip). The newly added robotic arm is made of lightweight aluminum alloy and ABS material, with a flexible gripper/electromagnetic suction cup at the end. It works with an RGB-D depth camera and vision algorithms to achieve centimeter-level material recognition and dynamic obstacle avoidance compensation. The lift table supports precise lifting at 250 mm/s, expanding the three-dimensional working space to 600 mm. The navigation system has improved SLAM algorithms to achieve dynamic obstacle avoidance in dense environments (response time < 0.5 seconds). The robotic arm is compatible with Python/C++ development environments, allowing users to program via a visual interface or deeply customise robotic arm trajectories and grasping strategies. With open ROS interfaces and modular navigation protocols, compared to the educational version CMR-D1, its overall efficiency has improved by 50%, and operational costs have decreased by 30%, making it a core automated solution integrating 'space-precision-load' in smart factories.



Main Functions:

1. Laser Mapping and Obstacle Avoidance
2. High-Precision Navigation
3. Robotic Arm Gripping
4. Multi-Source Data Closed-Loop
5. Vertical Electric Lift Expansion
6. Standard Protocols and Data Communication

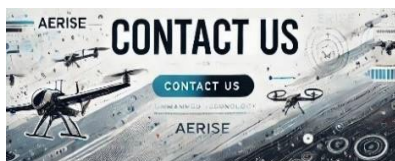
Robotic Arm Parameters

Parameters	Details
Working Radius	622 mm
Payload	3 kg
Material / Body Weight	Aluminum + steel / about 10 kg
Repeatable Accuracy	± 0.5 mm
Terminal Velocity	≤ 2 m/s
Human–Computer Interaction	10.1-inch teaching device or mobile terminal app
IO Port	2 DI, 2 DO, 1 AI, 1 AO
Noise	< 65 dB
Power Supply	24V / 1.5A
Protection Rating	IP54
Typical Power	200W (average), 230W (peak)
Working Environment	-20 – 60°C, humidity $\leq 90\%$ RH (no condensation)



Product Technical Parameter

Parameter	Details
Overall Dimensions (L*W*H)	730*460*260 mm
Chassis Weight	46 kg
Materials	Q235
Vertical Load	120 kg
Encoder Line Count	4096 lines
Protection Rating	IP22
Operating Temperature	-10 – 60°C
Charging Time	< 3 h
Motor Power	150 W × 2
Motor Type	Hub motor (brushless DC)
Maximum Speed	1.5 m/s
Theoretical Battery Life	> 4 h
Battery Capacity	24V 40AH (lithium battery, expandable)
External Power Supply	24V / 19V / 12V
Emergency Stop Method	Remote emergency stop / hardware emergency stop / software emergency stop
System Support	ROS / WIN / UBUNTU
Navigation Method	Laser navigation (2D SLAM)
Navigation Accuracy	±30 mm
Navigation Protocol	MQTT
Remote Control Mode	2.4G RC Model Remote Control
Obstacle Avoidance Method	Supports obstacle detection and obstacle avoidance
Navigation Mode	Point-to-point, predetermined route, trajectory, etc.
Turning Radius	Rotate in place (0°)
Auxiliary Positioning Accuracy	±10 mm



Motorized Jaw Parameters

Parameters	Details
Recommended Load	3 kg
Weight	0.46 kg
Rated Clamping Force	10–35 N
Power Supply	24V (DC)
Opening and Closing Distance	0–90 mm
Communication	RS485
Controller	Built-in
Self-Locking	Not supported
IO Port	2 DI / 2 DO
External Interface	1 UART

