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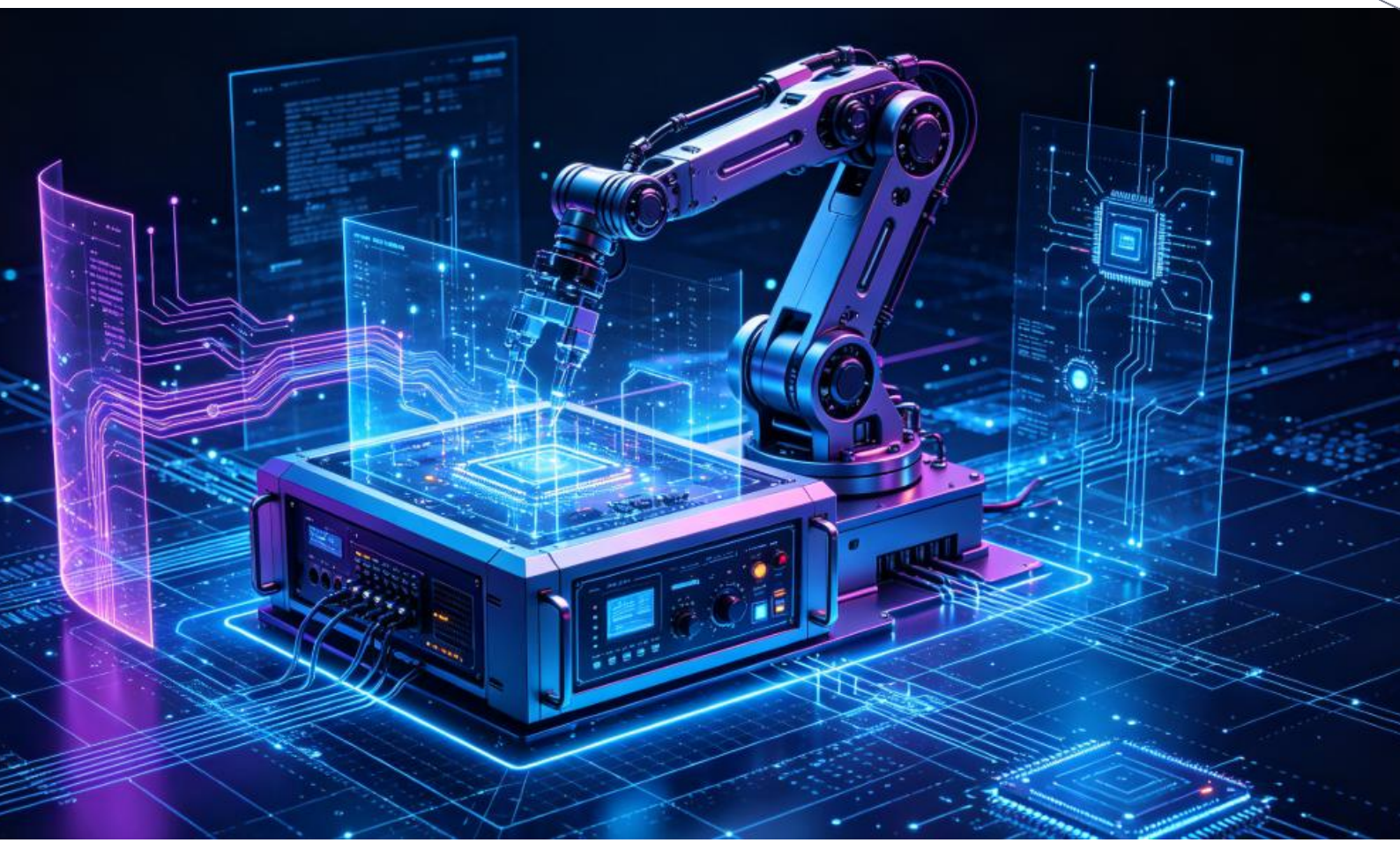

Global Robotic Control System Industry Report

Executive Summary

This report analyzes the global robotic control system industry and introduces its dual embedded and cloud-based hybrid architecture serving as the intelligent core of robots. Boosted by diversified industrial demands and AGI technological breakthroughs, the sector will maintain steady growth amid technical and ecological barriers, where algorithm and system capabilities form core competitive advantages.

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1. Market Overview

1.1 Market Definition

The control system serves as the "brain" of an intelligent robot, enabling autonomous operation and environmental adaptation through a hybrid architecture that balances individual autonomy with collaborative efficiency. It consists of two key parts:

Embedded Controller: Located inside the robot; integrates algorithms for sensor management, localization (e.g., SLAM), and precise motion control to handle perception and movement.

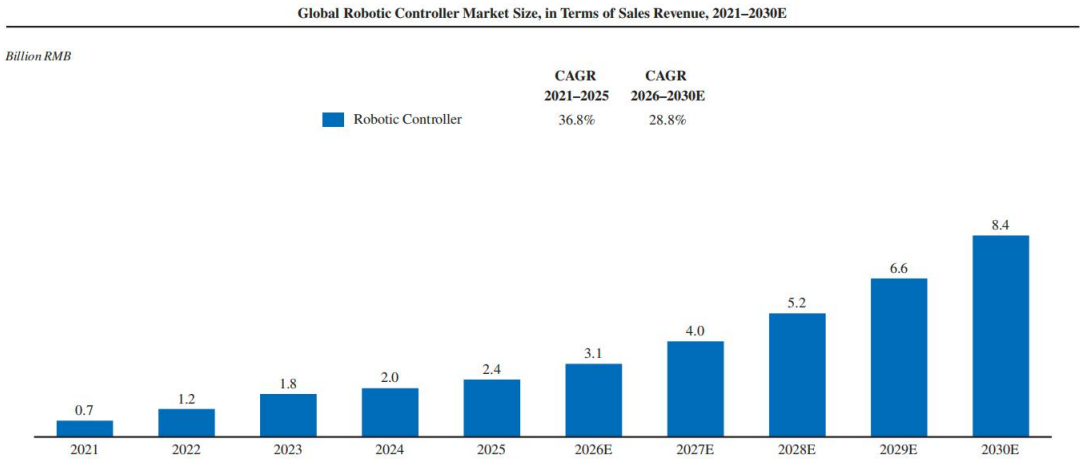
Cloud-Based Software: Manages the fleet by using intelligent scheduling and optimization to distribute tasks and coordinate multiple robots.

1.2 Market Size

The global robotic control system market maintains growth, with an estimated 2025 total addressable market of RMB100.0 billion, accounting for 10%–20% of a robot's total bill of materials ("BoM"). Controllers are sold in embedded or standalone forms, and standalone vendors generate revenue mainly from integrated solutions. Driven by wider robot adoption and rising task complexity,

standalone controller penetration climbed from 1.2% in 2021 to 3.7% in 2025, and is projected to reach 7.3% by 2030.

Global standalone robotic controller shipments grew from 6.0 thousand units in 2021 to 49.7 thousand units in 2025 (CAGR 69.8%), and are expected to reach 308.3 thousand units by 2030. Revenue increased from RMB0.7 billion in 2021 to RMB2.4 billion in 2025 (CAGR 36.8%), and is projected to hit RMB8.4 billion by 2030. China leads the global market with approximately 50% share; its standalone controller shipments will grow from 25.7 thousand units in 2025 to 151.0 thousand units by 2030.



Note:

(1) Represents the aggregate sales of (a) controllers installed on robots and (b) robotic controllers sold as standalone products, which are sold by providers

engaged in standalone controller sales. The robotic controller market size includes only revenue generated from commercially sold controller units by providers engaged in standalone controllers, excluding controllers used internally by robot manufacturers.

Sources: Mobile Robot and AGV/AMR Industry Alliance, CIC Reports

2. Key Growth Drivers and Trends

2.1 Key Drivers and Trends

Decentralization of Application Scenarios

The diverse demands across a variety of industries make it difficult for a single company to develop customized control systems that cater to all these varying needs. Many manufacturers are opting to purchase mature controllers and control systems from external suppliers, which allows for faster product iteration and easier adaptation to different application scenarios.

Maturity of Supply Chain and Breakthroughs in Core Technologies

With the stabilization of raw material costs and ongoing advancements in production processes, the hardware manufacturing costs of controllers are expected to continue declining. Additionally, breakthroughs in core technologies, particularly the integration of AGI into control system algorithms, have significantly enhanced the intelligence and collaborative capabilities of robots.

2.2 Future Outlook

The global robotic control system market will sustain strong growth

ahead. Diverse application scenarios drive robot manufacturers to adopt third-party ready-made controllers for faster product iteration, while maturing supply chains reduce hardware costs. AGI-embedded control algorithms will greatly enhance robots' environmental adaptability and multi-robot collaboration, and China will remain a core player in the global market.

However, the industry faces prominent barriers curbing rapid growth. New entrants must surmount high technical hurdles including core algorithms, self-developed real-time operating systems and cross-hardware interoperability standards. Fragmented ecosystems and rigid controller architectures also drive high integration costs due to the absence of universal development frameworks. In the long term, players will advance unified standards to reduce fragmentation, yet algorithm and system capabilities will remain key competitive edges for leading vendors.

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CIC is a professional consulting firm offering tailored end-to-end support across the full investment and financing lifecycle. The firm boasts a world-leading track record in guiding landmark first-in-sector IPOs across global markets, alongside unrivaled reach and in-depth coverage capabilities across specialized niche market segments.

CIC helps enterprises refine scalable business models and craft compelling capital narratives to enable seamless access to global capital markets, while serving as a trusted due diligence partner to investment institutions. It delivers granular industry insights and direct access to subject matter experts, empowering clients to identify high-value opportunities and mitigate critical risks effectively.

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chemicals, industrial manufacturing, and agriculture—delivering unparalleled access to sector-specific, actionable insights.

CIC Reports & Industry Overview

At CIC, we employ a rigorous, multi-method research framework, combining primary and secondary sources to underpin our analysis. Primary research involves in-depth engagements with industry thought leaders and practitioners, particularly in supply chain finance. Secondary research synthesizes publicly available datasets from authoritative bodies, including the National Bureau of Statistics of the People's Republic of China, the State Administration of Financial Regulation (SAFR, formerly the China Banking and Insurance Regulatory Commission), the China Securities Regulatory Commission (CSRC), and public company filings. We apply proprietary data analytics frameworks to process collected information, validating findings through cross-referencing data from multiple research streams to ensure analytical rigor and reliability.

All statistical data presented is verifiable and grounded in information available as of the date of this report.

Extracts are refined summaries of in-depth CIC industry research reports, highlighting supply and demand trends, key growth drivers, R&D trends and future outlook, etc. of various segmented fields, integrating multi-dimensional insights such as expert interviews, market surveys and industry data analysis.

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