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# Global All-in-one Embodied Intelligent Controller Supply, Demand and Key Producers, 2026-2032

https://marketpublishers.com/r/G3BFBF2F3AE4EN.html
Date: April 2026
Pages: 122
Price: US$ 4,480.00 (Single User License)
ID: G3BFBF2F3AE4EN

## Abstracts

The global All-in-one Embodied Intelligent Controller market size is expected to reach $ 1279 million by 2032, rising at a market growth of 26.7% CAGR during the forecast period (2026-2032).

The essence of embodied intelligence is to endow artificial intelligence with a physical body capable of perceiving and acting in the real world. Among various forms, humanoid robots, due to their inherent compatibility with the human environment, are considered the most promising carrier for realizing general embodied intelligence. Currently, the industry generally adopts a three-layer architecture of 'brain, cerebellum, and body' to deconstruct the humanoid robot system. The core idea of ??this architecture is 'intelligent decoupling,' separating complex cognitive tasks from high-precision real-time control. The 'brain' refers to the large AI model, responsible for language understanding, environmental perception, and advanced task decision-making; the 'cerebellum' is the motion control algorithm, which schedules the robot's coordination and balance, and real-time obstacle avoidance; the 'body' is the hardware carrier, including skeletal structure, joint motors, sensors, and dexterous hands, responsible for the final execution of actions. Similar to the functional division of the human brain, current humanoid robot controllers generally adopt a 'brain-cerebellum' separation architecture: the 'brain' is responsible for perceiving the environment, planning routes, and making intelligent decisions (such as recognizing gestures, understanding speech, and autonomously learning new skills); the 'cerebellum' acts like a 'sports expert,' coordinating joint motors thousands of times per second to ensure the robot doesn't fall while dancing or its hands don't tremble when lifting objects. The 'cerebellum-cerebellum fusion' architecture, however, refers to the deep collaboration between the cognitive decision-making system (brain) and the motor control system (cerebellum), achieving seamless integration of 'perception-decision-execution' through

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integrated hardware and software design. The proposal and evolution of this architecture is the core thread of embodied intelligence development—its concept originates from the cross-integration of brain science and AI, aiming to simulate the division of labor and cooperation mechanism between high-level cognition and motor coordination in the human nervous system, making the robot's 'thinking' and 'action' more synchronized and efficient. The All-in-one Embodied Intelligent Controller refers to an advanced robot control system that completely integrates high-level cognitive decision-making (brain function) and motor coordination and balance control (cerebellum function) into the same controller unit, forming a unified decision-making-action closed loop. In 2025, the global production of All-in-one Embodied Intelligent Controller is estimated at approximately 147,410 units, with an average price of approximately US$1,604 per unit and a gross profit margin of approximately 35.61%.

As the core 'brain-level' component of robotic systems, robot domain controllers are entering a critical window of explosive growth. With the significant increase in demand for high autonomy and intelligent behavior in global smart manufacturing, automated services, security, and medical rehabilitation scenarios, humanoid robots and other embodied intelligent equipment are rapidly moving from research and development to commercial deployment. Breakthroughs in AI computing power and sensor technology have endowed domain controllers with powerful real-time perception and reasoning capabilities, enabling robots to better understand their environment, plan their behavior, and autonomously execute tasks. Simultaneously, policy encouragement and active investment from industrial capital are driving the marketization of robots as a whole and their core intelligent components, creating enormous growth potential for the domain controller market. Despite this promising outlook, the robot domain controller industry still faces numerous challenges. The high technical barriers to entry for high-performance domain controllers, integrating AI inference, high-speed communication, and complex sensor data fusion, result in substantial R&D investment and high product costs, creating entry barriers for small and medium-sized manufacturers. Furthermore, the overall robot ecosystem is still immature, standardization across multiple scenarios is difficult to unify, and control algorithms and safety strategies require long-term validation in real-world environments. Fluctuations in the supply chains of core chips and sensors, as well as global trade frictions, may also put pressure on the supply side, all of which could affect the pace of market expansion. Downstream demand is showing a diversified growth trend. Industry and logistics are the first markets where robot domain controllers will be deployed on a large scale, especially in standardized, high-density operation scenarios such as manufacturing lines and warehousing logistics, where the demand for intelligent scheduling and safe collaboration is strong. With declining costs and improved performance, service robots, human-robot collaborative

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robots, and home assistance robots are also growing rapidly, enabling domain controllers to expand from high-end research fields to a wider commercial market. Overall, the demand for domain controllers will spread from single industrial scenarios to multi-scenario integration, driving the accelerated upgrading of the entire intelligent robot industry chain.

Latest research: Current robots contain multiple controllers, including a brain controller, a cerebellum controller, and a chassis controller. To a certain extent, this dispersed hardware module leads to low space utilization and increases the complexity of hardware and software integration, such as wiring connections and system communication, causing difficulties in power supply and heat dissipation. The limited size of robots also restricts their ability to 'think' quickly. With the rapid iteration of large models, the AI ??computing power of the robot's edge chips is insufficient to effectively run the required AI models, especially VLA models (Visual Language Action Models). Using an external high-performance GPU chassis would severely hinder robot movement; while connecting to cloud-based AI computing power via a network makes the robot susceptible to network latency, even failing to function in the event of a network outage.

Robot domain control also requires strong CPU processing power to achieve high-frequency, precise joint movement control. To address this, Joyson Electronics recently launched an integrated 'full-domain controller' chest and chassis assembly for embodied intelligent robots, combining 'cerebellum-cerebellum fusion + power supply + heat dissipation.' Compared to current controller solutions, the chest cavity assembly solution saves over 50% of space, allowing it to be inserted into the robot's chest cavity; compared to the size of an external main unit chassis, the chassis assembly solution saves nearly 45% of space, allowing it to be directly placed into the robot's chassis.

This report studies the global All-in-one Embodied Intelligent Controller production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for All-in-one Embodied Intelligent Controller and provides market size (US$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of All-in-one Embodied Intelligent Controller that contribute to its increasing demand across many markets.

**Highlights and key features of the study**

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Global All-in-one Embodied Intelligent Controller total production and demand, 2021-2032, (K Units)

Global All-in-one Embodied Intelligent Controller total production value, 2021-2032, (USD Million)

Global All-in-one Embodied Intelligent Controller production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (K Units), (based on production site)

Global All-in-one Embodied Intelligent Controller consumption by region & country, CAGR, 2021-2032 & (K Units)

U.S. VS China: All-in-one Embodied Intelligent Controller domestic production, consumption, key domestic manufacturers and share

Global All-in-one Embodied Intelligent Controller production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (K Units)

Global All-in-one Embodied Intelligent Controller production by Type, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

Global All-in-one Embodied Intelligent Controller production by Application, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

This report profiles key players in the global All-in-one Embodied Intelligent Controller market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include JOYSON ELECTRONICS, JWIPC TECHNOLOGY, Horizon Robotics, iMotion Technology, Chengdu Apq Science And Technology Co., Ltd., AgiBot, DexForce, Beijing Innovation Center of Humanoid Robotics Co.,Ltd., UBTech Robotics, Beijing Xingyuan Intelligent Robot Technology Co., Ltd., etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World All-in-one Embodied Intelligent Controller market

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**Detailed Segmentation:**

Each section contains quantitative market data including market by value (US$ Millions), volume (production, consumption) & (K Units) and average price (US$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global All-in-one Embodied Intelligent Controller Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global All-in-one Embodied Intelligent Controller Market, Segmentation by Type:

Low TOPS

Medium TOPS

High TOPS

Global All-in-one Embodied Intelligent Controller Market, Segmentation by Robot:

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Robot Dog

Wheeled Humanoid Robot

Bipedal Humanoid Robot

Other

Global All-in-one Embodied Intelligent Controller Market, Segmentation by Power Consumption:

Low Power Consumption

High Power Consumption

Global All-in-one Embodied Intelligent Controller Market, Segmentation by Application:

Commercial Services

Intelligent Manufacturing

Logistics and Security

Others

Companies Profiled:

JOYSON ELECTRONICS

JWIPC TECHNOLOGY

Horizon Robotics

iMotion Technology

Chengdu Apq Science And Technology Co., Ltd.

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AgiBot

DexForce

Beijing Innovation Center of Humanoid Robotics Co.,Ltd.

UBTech Robotics

Beijing Xingyuan Intelligent Robot Technology Co., Ltd.

Zhejiang Sanhua Intelligent Controls Co.,Ltd.

NIIC

Independent variable: Robotics Technology (Jinan) Co., Ltd

**Key Questions Answered:**

1. How big is the global All-in-one Embodied Intelligent Controller market?
2. What is the demand of the global All-in-one Embodied Intelligent Controller market?
3. What is the year over year growth of the global All-in-one Embodied Intelligent Controller market?
4. What is the production and production value of the global All-in-one Embodied Intelligent Controller market?
5. Who are the key producers in the global All-in-one Embodied Intelligent Controller market?
6. What are the growth factors driving the market demand?

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