Use Case

Robotic Arm Controller Solutions

Streamline Real-Time Operations and Enhance Productivity



ADLINK
LEADING EDGE COMPUTING

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Robot

Controller All-Rounder Adaptable In Every Way

ADLINK's Robot Controller Provides a Reliable and Adaptable Computing Solution for Complex AI-powered Robot Arm Applications

Customizable

Customization and Compatibility enables seamless system integration.

Performance

Efficient, robust controller for 24/7 industrial AI tasks.

Security

Whole machine encryption protects data and ensures supply chain integrity.

Industry-solutions

Versatile, tailored solutions for diverse industrial automation needs.

In this use case, the transformative capabilities of the ADLINK MVP-6200 controller are leveraged to advance smart warehousing operations. This controller, integral to the operation of a state-of-the-art robotic arm, offers unmatched motion control and AI-enhanced visual recognition. ADLINK's Adaptive Function Module (AFM) plays a crucial role, enabling highly customized solutions that meet specific client needs and adapt to various operational scenarios. This technological integration not only increases the efficiency and flexibility of warehouse automation globally but also exemplifies the significant impact of innovative collaborations in enhancing the functionality and effectiveness of logistics systems. The deployment of the ADLINK MVP-6200 in these settings underscores the critical importance of sophisticated control systems in optimizing modern warehouse operations.

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AI-powered Robot Arms Accelerate Logistics Throughput.

Soaring labor costs. Labor supply uncertainty. No wonder labor-intensive industries, like logistics, are accelerating their automation plans in an effort to stabilize their production capacity. This push for more automation is evident with the widespread adoption of smart pallets, AMRs, smart conveyor belts, and automated handling systems. Now, AI-powered robot arms, which are flexible enough to perform many different roles, are set to deliver a wide range of new opportunities for automation in logistics and elsewhere.

Software drives this innovation, and specialist AI startups are developing AI algorithms for robots in different applications. The numbers support this interest, especially when 4x growth is expected in the AI industrial robotics market from 2024 to 2030 (Statista). Those AI startups need trusted computer hardware to power their proprietary algorithms.

Our customer, a Japanese logistics startup that develops control software and algorithms, needed a robot controller for its AI application. As a software-focused company, it was looking for a reliable long-term solution provider that could deliver computer hardware customized to its exact specifications. High-performance computing firepower, various specialized interfaces, connectivity with other parts of the sorting lines, softwarecompatibility, and unwavering reliability were all non-negotiable. The ADLINK MVP-6200, with its Adaptive Function Module (AFM), Ubuntu Certified hardware, and next-gen Intel performance, answered all these challenges.



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Challenges & Requirements

The integrator's dilemma is ensuring that all components provide the functionality and compatibility to work together seamlessly to provide the intended functionality of the client's system. Integrators also want consistency between similar hardware systems so they can leverage their development efforts and reuse their solutions on related systems. They face challenges with compatibility, reliability, scalability, and performance.





MVP-6400

14/13/12th Generation Intel® Processor-Based, Expandable Modular Industrial Computers with 4 Expansion Slots

MVP-5200

14/13/12th Generation Intel® Processor-Based Compact Modular Industrial Computers

MVP-6200

14/13/12th Generation Intel® Processor-Based, Expandable Modular Industrial Computers with 2 Expansion Slots

intel partner Titanium

Ubuntu Certified

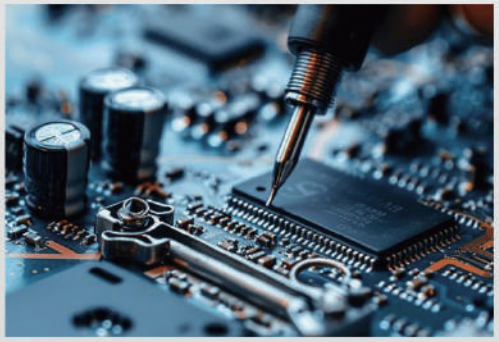
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Compatibility

Often bundled under the verification banner, compatibility means predictable interoperability between the main system hardware, add-on system hardware, software, and any external devices connected to the system. With such a complex ecosystem of computer components, a bug or incompatibility can easily add days to the development process.

Hardware Predictability

BOM substitutions can cause unforeseen incompatibilities and unpredictable system behavior. Exact match BOMs are more difficult for hardware manufacturers but are a value-add that gives peace of mind to customers who want to deliver truly world-class solutions and ensure compatibility with their software applications.



Software Compatibility

Software-focused startups are reliant on the underlying software in their applications, and incompatibilities can break everything. AI startups need a consistent and predictable software base so they can focus on software development and know their rollouts to remote systems will work every time. That means that all hardware must be 100% compatible with the software platform of choice.



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Reliability

Fancy solutions that don't last cause knock-on costs that far outweigh the original gains. Startups know that large organizations are cautious with their investments and place a lot of trust in the continuity of their business systems. One small misstep can cost thousands or even millions in lost revenue, not to mention the customer service nightmare when missing deadlines. Reliability comes from the combination of quality components, failsafe design choices, and exceptional expansion.

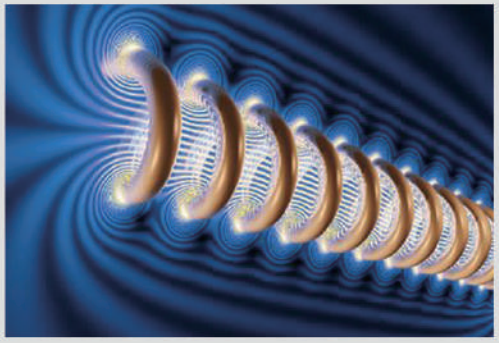
Whole Machine Encryption

Unpredictable environments multiply the points of possible security breaches and attacks. Encryption covers all the bases and protects data from getting into the wrong hands and being used for malicious applications.



Industrial strength

Systems with a small footprint for space-constrained applications must address overheating to avoid throttling or system shutdown. Fanless systems are the preferred choice because they forego failure-prone fans, but they make heat management even more difficult.



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Scalability

Leveraging specialized development is key to squeezing out maximum value for your efforts. The trouble comes when a solution is so specialized that it cannot be used again or for any other application. Flexible hardware needs to adapt without sacrificing the compatibility or reliability of the hardware.

Industry-specific I/Os

Many peripherals have shifted to de facto standards like USB, and these connectors, standard on most systems, are a solid starting point for the computer system. However, connection standards such as RS-232/422/485 are widely used in industry but only in some applications. The computer must include a way to add these connectors without breaking reliability.



Customized connectors

for 2D/3D cameras, tablet teach pendants, sensors, scanners, and other peripherals often connect to the mainboard with cables. Those cables can easily come loose over time in environments with vibrations and shocks, or become corroded. Using a non-cable connector provides a more reliable and long-lasting solution.



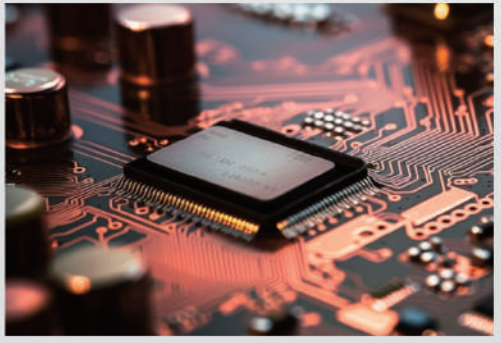
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Performance

Performance is an important factor in ensuring the system's adequate functioning. There is a fine line when balancing performance against reliability and compatibility while still allowing for the scalability that enables leading solutions to be implemented across multiple scenarios. Performance hinges on the core computer parts of CPU, GPU, and memory.

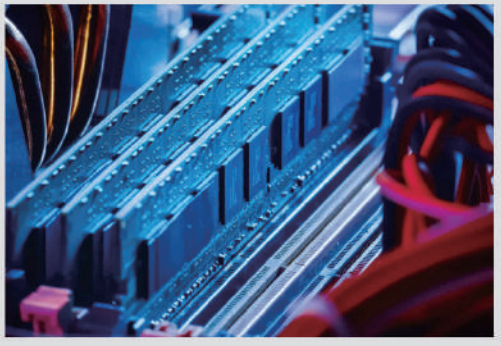
Power-efficient CPU and GPU expansion

The best CPU choice is new processors with a good balance of performance and efficiency that adjusts as needed. These CPUs provide the power for multi-tasking, but AI applications need more. GPUs provide the parallel computing power that is crucial for crunching the stream of data from cameras, sensors, and other inputs.



Fast and plentiful memory

DDR5, the latest memory generation, is faster and offers greater capacity. That greater capacity is an important part of the AI processing paradigm because the large incoming data stream of video or images needs to be stored and processed in memory. Speed and capacity are both crucial.



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What Are the Key Requirements for Optimal AI Robot Arm Systems?

What the AI-powered robot arm maker needed was a system that guarantees compatibility, operates with the reliability needed for 24/7 robot arm operation, scales to meet the requirements of additional components in the system or new systems, and provides the requisite computing performance to keep things going smoothly.

ADLINK provides the computing backbone for many of the leading names in industrial automation. In recent years, we've focused more on designing systems that meet the unique requirements of Edge AI and AI cameras for AI visual recognition.
For this AI application, we recommended the Ubuntu Certified MVP-6200 with AFM, put it through whole-machine encryption testing, and put an iron-clad seal on the supply chain.



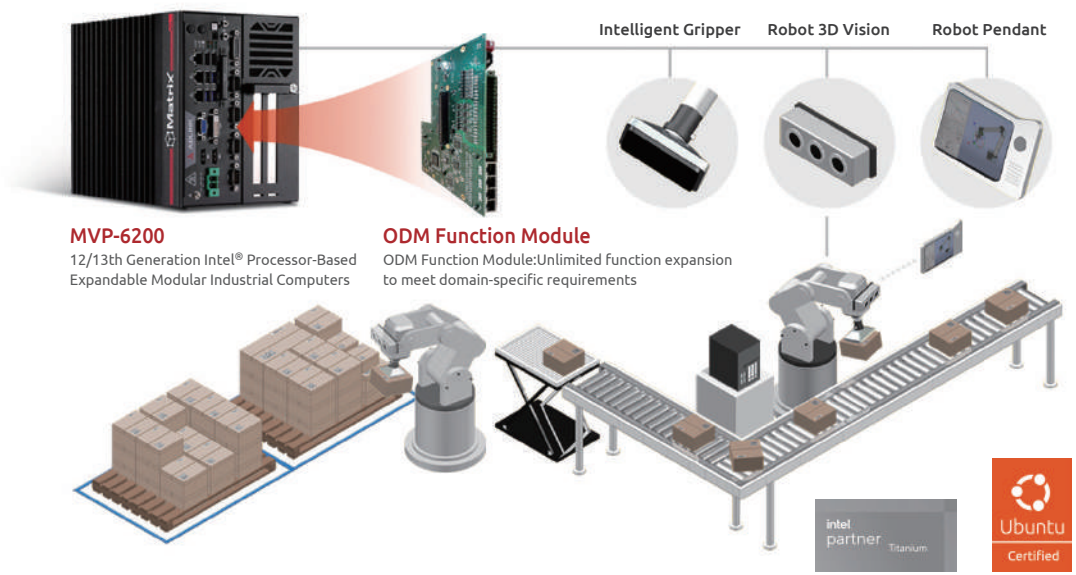
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Customizable Security and Connectivity for Industrial Applications

The MVP-6200 with AFM is an expandable fanless embedded computer with 14/13/12th generation Intel® CPU, DDR5 memory support, selection of I/Os, and GPU slot. For the unique requirements of a robot controller, we developed a customized AFM module with connectors for the gripper, vision camera, and teach pendant. The AFM module bolts in between the system chassis and GPU chassis, providing a no-wires addon with all the connectors they need.

Whole machine encryption was a unique request that we were happy to accommodate. Specifically for industrial computers, the process involved a battery of tests that aimed to secure data during transmission and storage from unauthorized access or tampering. This additional service is not always easy to implement, and many of our competitors don't provide it due to the difficulties, so it's another reason they chose ADLINK.



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ADLINK's Commitment to Quality: Ensuring Hardware Compatibility and Supply Chain Integrity

The MVP-6200 is Ubuntu Certified. ADLINK does extensive in-house testing to assure the compatibility and reliability of every hardware and software combination. We also put our products through unbiased third-party testing to hold us accountable and give you the peace of mind that testing has been as thorough as we claim.

Supply chain integrity. We work with trusted providers in the industry to ensure that every part that we promise in our specifications is exactly as stated. No unexpected substitutions. This is not an easy feat with hundreds of individual parts, but we pride ourselves on delivering precisely what you ordered. No surprises. Only unwavering predictability.

ADLINK MVP-5200/MVP-6200—
Certified, reliable, and meticulously verified for superior supply chain integrity.



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Robot Controller for AI-Powered Robot Arms

At ADLINK, we have our fingers on the pulse of the industry. We see shifts in the industry as novel challenges and an opportunity to prove why our valued customers stick with us for the long term. We've developed computer solutions for almost every industrial application you can think of, and we keep extending our lineup with new features that not only keep pace with the latest developments but also look ahead to begin creating the computers that will power the world of tomorrow.





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Application Featured Design

Ruggedized Design

Complete Solutions

Diverse I/O and Expansion

Fanless Design

Selected Solutions for Robotic Arm Controller

Modular Industrial Computers MVP Series

Compact Modular Industrial Computers



MVP-5200 Series

12/13/14th Gen Intel® Core™ i9/ i7/ i5/ i3
Compact Fanless Computers

- Microsoft® Windows® or Linux® Ubuntu OS option
- Rugged, -20°C to 60°C fanless design for 24/7 operation
- Scalable with ADLINK AFM (Adaptive Function Module) slot

Expandable Modular Industrial Computers



MVP-6200 Series

12/13/14th Gen Intel® Core™ i9/ i7/ i5/ i3
Expandable Fanless Computers

- Microsoft® Windows® or Linux® Ubuntu OS option
- Rugged, -20°C to 60°C fanless design for 24/7 operation
- Scalable with ADLINK Adaptive Function Module slot
- Flexible modular expansion support

We invite you to start here with ADLINK

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HEAD OFFICE

ADLINK Technology, Inc.
No. 66, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan
Tel : +886-3-216-5088 Fax: +886-3-328-5706

www.adlinktech.com

ASIA

ADLINK Technology, Inc. (Hsinchu Liaison)
Rm. B, 9F., No. 30, Chenggong 13th St.,
Hsinchu County 302050 , Taiwan
Tel: +886-3-668-3790
Email: tw@adlinktech.com

ADLINK Technology, Inc. (Taichung Liaison)
12F.-2, No. 262, Sec. 2, Henan Rd., Xitun Dist.,
Taichung City 407349, Taiwan
Tel: +886-4-2708-2338
Email: tw@adlinktech.com

ADLINK Technology, Inc. (Tainan Liaison)
Rm. A, 6F., No. 1-5, Zhonghua Rd., Yongkang Dist.,
Tainan City 710044, Taiwan
Tel: +886-6-313-7768
Email: tw@adlinktech.com

ADLINK Technology Japan Corporation (Tokyo Office)
〒 101-0045 東京都千代田区神田鍛冶町 3-7-4
KDX 神田駅前ビル 4F
Tel: +81-3-5209-6001
Email: japan@adlinktech.com

ADLINK Technology Korea Ltd.
A-1503, U-TOWER, 767 Sinsu-ro, Suji-gu, Yongin-si,
Gyeonggi-do, Republic of Korea, 16827
Toll Free: +82-80-800-0585
Email: korea@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.
1008 Toa Payoh North, 07-17/18
Singapore 318996
Tel: +65-6844-2261
Email: singapore@adlinktech.com

ADLINK Technology India Private Limited
Ground Floor, 317, Samanvitha Complex, Mayura
Street, Outer Ring Road, Byatarayanapura, Bangalore North,
Bangalore- 560092, Karnataka
Tel: +886-2-8226-5877
Email: india@adlinktech.com

ADLINK Technology Japan Corporation (Nagoya office)
LINKS Meieki Bldg. 3F, 5-31-10 Meieki,
Nakamura-ku, Nagoya-city, Aichi 450-0002, Japan
Tel: +81-52-589-9018
Email: japan@adlinktech.com

CHINA

ADLINK Technology (China) Co., Ltd.
300 Fang Chun Rd., Zhangjiang Hi-Tech Park,
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Email: market@adlinktech.com

ADLINK Technology Shenzhen
F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7,
High-Tech Industrial Park S., Shenzhen, 518057 China
Tel: +86-755-2643-4858
Email: market@adlinktech.com

ADLINK Technology Chengdu
Rm. 4207, 500 Tianfu Blvd Middle Section, Wuhou District,
Chengdu, Sichuan, China, 610023
Tel: +86-28-85216698
Email: market@adlinktech.com

ADLINK Technology Nanjing
Rm. 1908, 105 Zhongshan N Rd, Gulou, Nanjing,
Jiangsu, China, 210093
Tel: +86-25-86652110
Email: market@adlinktech.com

ADLINK Technology Beijing
Rm. 801, Power Creative E, No. 1, Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Email: market@adlinktech.com

ADLINK Technology Beijing
Rm. 801, Power Creative E, No. 1, Shang Di East Rd.,
Beijing, 100085 China
Tel: +86-10-5885-8666
Email: market@adlinktech.com

EUROPE, THE MIDDLE EAST AND AFRICA

ADLINK Technology GmbH
Hans-Thoma-Straße 11, 68163 Mannheim,
Germany
Tel: +49-621-43214-0
Email: emea@adlinktech.com

ADLINK Technology GmbH (Healthcare Business Center)
Ulrichsbergerstraße 17,94469 Deggendorf, Germany
Tel: +49-991-29094-10
Email: info.deg@adlinktech.com

ADLINK Technology, Inc. (UK Liaison Office)
First Floor West Exeter House, Chichester fields Business Park.
Tangmere, West Sussex, PO20 2FU. United Kingdom
Tel: +44-1243-859677
Email: uk@adlinktech.com

USA

Ampro ADLINK Technology, Inc.
6450 Via Del Oro, San Jose, CA 95119, USA
Toll Free: +1-800-966-5200
Email: info@adlinktech.com

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