ADLINK
LEADING EDGE COMPUTING

Automating Smart Logistics with Innovative ATX Motherboard Technology



Explore how supply chains do more with computer vision.

Solution Brief

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Automating Smart Logistics with Innovative ATX Motherboard Technology

Overview

Logistics companies are straining under the unrelenting growth in e-commerce fueled by omnichannel strategies. With e-commerce, retail, and manufacturing all relying on robust logistics systems to drive business growth, logistics operators are looking for the best way to tackle the challenges of scattered orders, concentrated arrivals, strict logistics deadlines, and cost control pressures.

Logistics providers have begun reevaluating their current systems, as they now realize that supply chain management efficiency and inventory management flexibility are key. They are keen to find ways to optimize labor costs, enhance transportation efficiency, reduce delivery times, and maximize the benefits of warehousing and logistics.

Smart logistics, which has received a lot of attention recently, is seen as the way forward. Smart logistics is driving the logistics industry to accelerate digital transformation, necessitating the adoption of smart logistics management solutions. The hope is that by leveraging technologies such as big data, AI, and IoT, the industry can meet the increasingly complex demands of the market.



Transitioning from traditional to smart logistics

Traditional logistics tends to be labor-intensive with manual processing of orders, and scanning of barcodes and RFID tags. The trouble is that scanning is prone to inaccuracies, and the stressful working environment means high personnel turnover and difficulty in recruiting workers. Logistics providers must address staffing limitations, shorten package processing time, and provide world-class customer service to meet the rising expectations of customers. At this moment, smart logistics is the best way to achieve these goals.

Smart logistics hinges on information technology, particularly computer vision—an AI-powered way for a computer to see and identify everyday things—introduced into various parts of the logistics process, including transportation, warehousing, packaging, loading and unloading, distribution, processing, and delivery. The data automatically collected from operations is then analyzed to make optimal decisions through such elements as equipment sensing, data processing, Intelligent analysis, and decision optimization. These insights are invaluable, but the systems that must collect this data have computing demands that often exceed the capabilities of standard industrial computers.

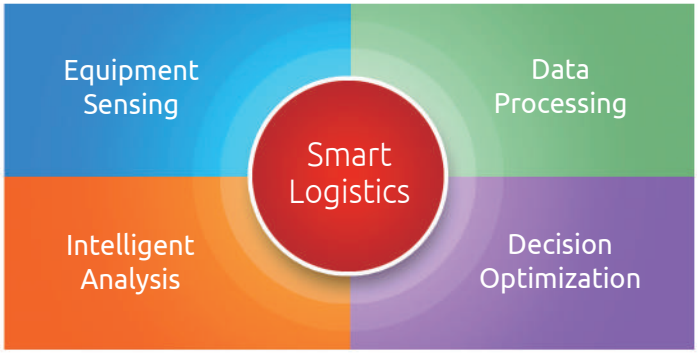


Figure 1: Smart Logistics Service Offerings

Industrial computers are at the heart of computing in industry, but typical industrial computers struggle to meet all the configuration requirements for smart logistics systems. An industrial computer for smart logistics needs to support many high-speed cameras, capture and transfer the high-definition images from those cameras to the computer, and then perform AI image recognition. This combination of tasks is beyond the abilities of many industrial computers. But this is where ADLINK shines.

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Automated cargo scanning tower

Utilizing the power of the ADLINK IMB-M47 ATX industrial motherboard, one system integrator developed a smart warehouse control tower with 16 cameras to be installed by the cargo bay at the customer's warehouse. When a forklift offloads the cargo through the cargo bay door, the tower scans the items on the pallet from four directions, checks the contents against the bill of lading (BOL), and raises an alert for issues such as missing barcodes, or OS&D.

They chose the ADLINK IMB-M47 ATX motherboard for the task because, with seven PCIe slots, there is enough expansion capacity to support the 16 cameras needed to capture critical images like cargo labels, BOL, and packages, while still leaving room to install a GPU to provide the computation needed for AI-powered image analysis. Additionally, the IMB-M47 offers numerous DIO interfaces, including 8x GPI and 8x GPO to connect to external sensors and alarms.

The ADLINK IMB-M47 is one of a handful of motherboards on the market that can support 16 cameras, so it has become the preferred choice of SIs in the United States.





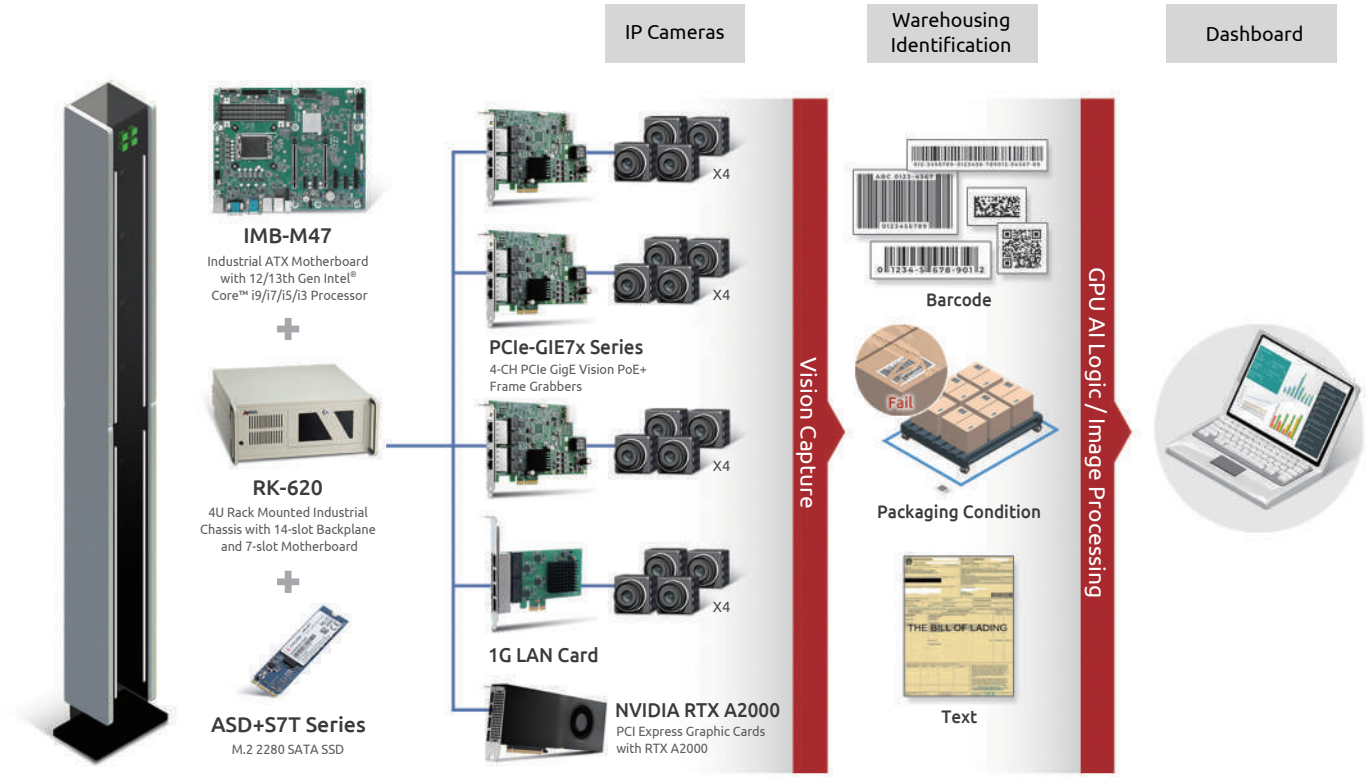
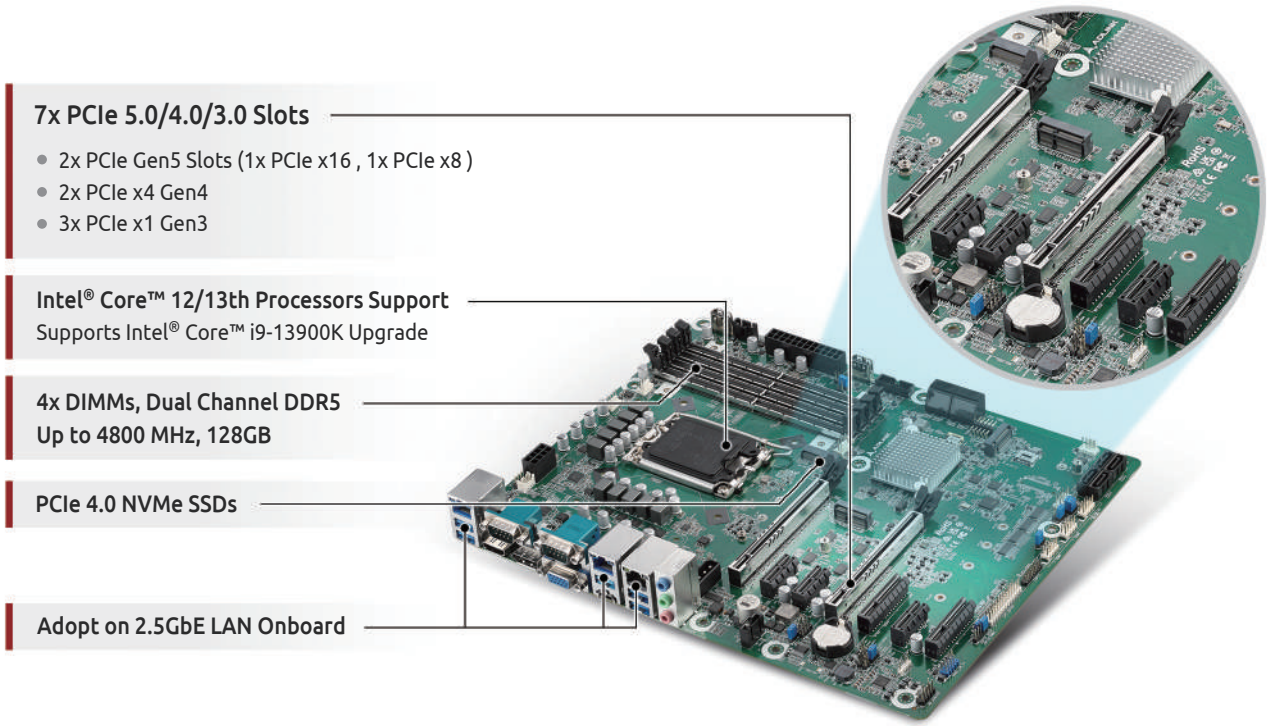


Figure 2: Architecture diagram of a smart logistics management system using the ADLINK IMB-M47 ATX motherboard

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ADLINK IMB-M47 ATX Industrial Motherboard: A Computing Powerhouse for AI Image Processing

The ADLINK IMB-M47 industrial ATX motherboard is the ideal choice for smart logistics and other edge AI applications that require large numbers of cameras for computer vision. The motherboard provides ample processing power to keep up with general computing demands with support for the latest 13th/12th Gen Intel processors as a solid backbone to the rest of the system. Bandwidth of up to 2.5x that of gigabit Ethernet gives the extra network throughput needed for increased data loads. Parallel processing prowess is the key to responsive real-time AI, so the IMB-M47 supports the latest PCIe Gen5 standard, enabling double the data rate compared to the previous generation, and giving an edge over devices designed for PCIe Gen4. Finally, the native expansion capacity provides a straightforward path to installing multiple add-on cards, such as the 16 cameras in this case, allowing the IMB-M47 to handle most applications. Major features are shown below:



PCIe x16 Gen5

GPUs need all the speed they can get. By supporting PCIe Gen5, the IMB-M47 PCIe x16 interface delivers double the bandwidth of Gen4, providing faster data transfer for AI image processing

PCIe x4 Gen4

These slots are used for the camera cards, providing sufficient bandwidth for high-speed image transfer. In the case above, this was enough to support 16 cameras.

DDR5 4800

The latest iteration of DDR doubles the speed of the previous generation, again providing a valuable speed boost for AI machine vision applications that require the highest speeds possible for true real-time data acquisition and alerts.

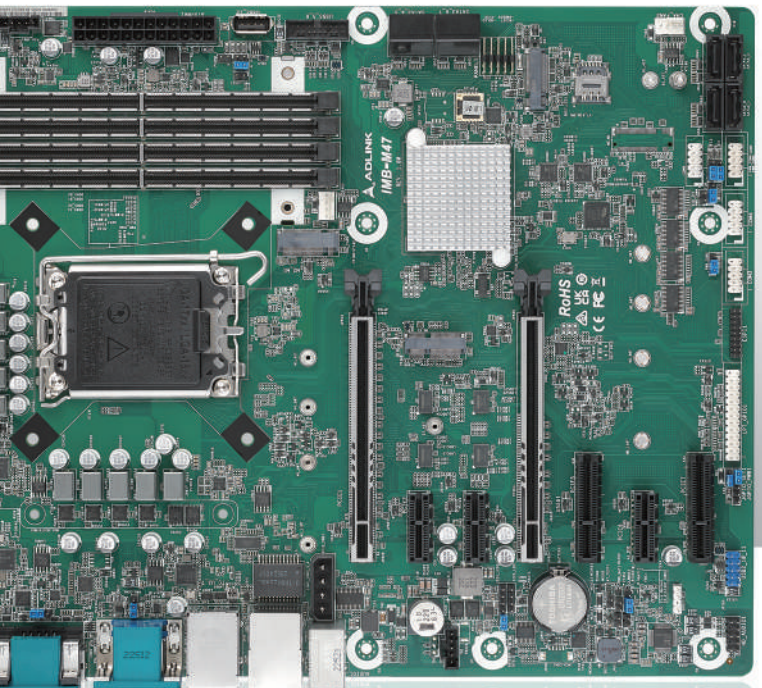
2.5GbE LAN

Boosting network performance is the final ingredient in responsive applications. As more data is passed over the network, the need for the fastest speeds possible becomes even more critical to timely response.

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ADLINK—Hardware at the Heart of AI

At ADLINK Technology Inc., all of our motherboards are tailored to solve some of the most pressing technology challenges across multiple industries. We understand that technology is the driving force in the evolution of AI-powered tools for not only smart logistics but the full spectrum of leading AI tech. The ADLINK IMB-M47 motherboard pushes the boundaries of current technologies by combining the latest PCIe Gen5, DDR5, and 2.5GbE LAN to enable cutting-edge AI solutions with real-time tracking, data analytics, and automation. Learn more about the ADLINK IMB-M47 or contact ADLINK for more information about products and solutions.



IMB-M47

The **IMB-M47** ATX motherboard featuring 7 PCIe slots and supporting DDR5 memory.

Empowering Smart Logistics Solutions with Diverse I/O



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