Enabling an Intelligent Planet

Cloud, Networking & Servers

Telecom, Enterprise, Industrial & Video Infrastructure

- Network Appliances
- Servers, Server Boards and Chassis
- Network Interface & Acceleration Cards
- GPU Solutions
- Video Infrastructure Solutions

ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

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About Advantech Cloud-IoT Group

Founded in 1983, Advantech is a global leader in the fields of IoT intelligent systems and embedded platforms. Advantech Cloud-IoT Group has being providing mission critical hardware to the world's leading industrial and networking equipment manufacturers for over 30 years. Whether it is wired or wireless, virtual or physical nodes at the core or the edge, Advantech's products are embedded in the telecommunications and industrial infrastructure that our world depends upon.

Quick Facts	
Headquarters	Taipei, Taiwan
Established	1983
Publicly listed	TPE: 2395
Employees	8,560
Revenue (2021)	USD $2.09 Billion
Worldwide support	95 cities, 28 Countries

Our customers can choose from the broadest choice of computing platforms in the industry, scaling from one to hundreds of cores, consolidating packet, application, and control processing onto a single architecture and one code base. Our technology leadership stems from field-proven design expertise on Intel® architecture combined with high performance switching, hardware acceleration, and innovative offload techniques.

We team up locally with customers and partners to evaluate project requirements, share application knowledge and build optimized solutions together. Our commercial off-the-shelf platforms coupled with pre-validated operating system and application support and remote evaluation services provide the foundations for rapid and smooth deployments. In addition, Advantech's customization capabilities allow customers to choose the precise level of differentiation, cost optimization or enhancement they require. This can range from small hardware or mechanical changes, to full-custom design or complete system branding, bundling and logistics services.

From Research & Development and support facilities in the USA, Europe and Asia, our customer-facing project teams link seamlessly into our worldwide network of over 8,000 employees. We manufacture to stringent quality procedures in our own ISO-9001 certified factories in Taiwan and China and our global integration and logistics centers operate on all continents to provide unified and localized services for optimum supply chain efficiency.

In this brochure, we bring together the core competences of our industrial, telecom, enterprise and video platforms. It also mirrors the market requirements we are observing, where operational, information and communication technologies are converging, accelerated by virtualization and consolidated onto servers for software-defined everything. The products represented here help solution providers extend services to the cloud and to the IoT edge, for a seamless transformation toward intelligent cloud-native operations. Supported by a vibrant software ecosystem and supply chain, Advantech Cloud-IoT Group is enabling the co-creation of solutions that will form the backbone of the new AIoT economy.

Your Trusted Infrastructure Partner
Leading the AIoT Digital Transformation

Companies that provide market leading solutions have learned that working with trusted partners that help them create value is one of the most critical factors to continued success. Good partners provide expertise, access to technology and time-to-market benefits that everyone can benefit from. Also crucial are development and manufacturing strategies that strive for excellence and deliver flexible and reliable platforms that maximize performance for cloud-based services. Our broad range of products combined with our customization capabilities, industry expertise, and global services allow us to firmly accompany customers through digital transformation towards a new AIoT infrastructure.

Advantech Cloud IoT Solutions

Advantech Advantage

Workload Optimized Performance & High Reliability

Product Longevity for Industrial Applications

Revision Control for Consistency and Efficiency

Flexibility on Customization to Meet Critical Needs

Applications

Network Infrastructure & Security

IoT Private Cloud

Industrial Equipment

Medical Equipment

AI, Deep Learning & Inference

FWA
Network Appliances

NMC Network Mezzanine Cards

FWA-1000 Series
Desktop Network Appliances

FWA-2000/3000/5000 Series
1U Rackmount Network Appliances

FWA-4000/6000 Series
2U Rackmount Network Appliances

NMC Series
1/10/25/40/100 GbE Network Modules

SKY
Industrial Servers

ASMB Server Board

HPC Server Chassis

SKY-6000 Series
Edge AI Servers

SKY-7000 Series
Edge Optimal Servers

SKY-8000 Series
Edge Critical Servers

SKY-9000 Series
Multi-node Servers

ASMB-600 Series
Edge Accelerator Server Boards

HPC-6000 Series
Edge Accelerator Server Chassis

Integrated Platform Management and Advanced Software Tools

Minimize TCO with Superior Performance and Reliability

Advantech highly reliable servers and network appliances integrate over 30 years of experience providing mission and business critical hardware to the world's leading equipment manufacturers, to meet the most demanding industrial, telecom, and enterprise application needs. They are designed and manufactured in-house by a team of 100+ R&D hardware and software engineers that thoughtfully select each component following strict DQA criteria. Built-in security, maintainability, and serviceability enhancements further improve performance and reliability, minimizing costly service interruptions and on-site technical interventions. Advanced platform features include redundant BIOS and firmware images, fail-safe remote updates, and wide-temperature operation from -40 to 65°C to deliver virtually zero downtime.

Advantech's solutions are more than high quality hardware designs as we go much further than ordinary hardware vendors. Our design and manufacturing process is fully owned by Advantech, which allows us to minimize supply chain risks and deliver competitive fully integrated, tested, and validated systems with faster time to market. In addition, our solutions are supported by a global service network and leverage Advantech's industrial product life cycle management.

Integration, Customization and Design Services

Starting from commercial-off-the-shelf platforms, we offer personalized products through a wide range of specialized services. All of our platforms are application-ready with branding options available including chassis color, logo and front bezel design. Customers can cost optimize our modular appliances and servers to reach their sweet spot of price, performance, and functionality. In addition, solution providers can leverage our customized COTS framework for semi-custom electronic or mechanical design as well as BIOS firmware.

Ecosystem Partnerships
Co-creating the Future of the IoT World

To ensure functionality of business critical solutions, Advantech has formed co-creation model that brings together industry leaders and innovators to foster technology teamwork, interoperability testing and solution development. Proven product interoperability means service and solution providers can readily integrate tested combinations of hardware and software components with total confidence. In a fast paced market this allows them to evaluate and deliver innovative solutions more rapidly and respond more effectively to emerging customer needs.

Participating ecosystem partners collaborate to meet customers' application-specific needs by facilitating the transformation of leading-edge embedded technologies into readily available business solutions. Our partner ecosystem is made up of leaders in each of their respective areas of expertise. Together, these companies provide all of the essential components for developing, verifying, integrating and building high performance products.

Choosing the Right Partners

Advantech works closely with leading silicon, virtualization, software, system integration and service provider partners to jointly address the challenges of open and disaggregated solutions bringing to market optimized solutions that have been certified to perform well together. Our verified platforms are capable of sustained processing for edge to cloud workloads spanning a wide range of industrial, communications and enterprise applications. These pre-validated, pre-optimized solutions accelerate deployment and time to revenue, while reducing integration risk for service and solution providers.

Transforming the Network Edge

The arrival of virtualization technologies and cloud-native architectures to the communications industry opens up new business models and no longer locks operators into fixed architectures. The new network infrastructure is flexible, modular and open. At Advantech, we understand that a strong co-working ecosystem is required to ensure that white boxes, middleware, operating systems, orchestration and network functions work together in this multi-vendor environment. We collaborate closely with hardware and software partners in different initiatives, from industry alliances such as Intel® Network Builders to Proof of Concepts, to ensure interoperability at the earliest possible stage in the development cycle and enable our customers with early access to the latest technology which accelerates their next generation product roll-outs.

If you'd like to join Advantech's Ecosystem Partner Program:

Please email us at **cloud.iot@advantech.com**

or visit **www.advantech.com/Cloud-IoT** for further details.

Added-value Software Solutions
To Improve Security, Reliability and Productivity

Going beyond high quality hardware design, Advantech offers advanced platform management, software tools that improve system availability, simplify operations, and accelerate time to market. Advantech's own team of software and firmware engineers integrates over 20 years of experience building BIOS, firmware, secure and cloud-native server management and diagnostics solutions for leading industry vendors. These field proven and modular, added-value software solutions are embedded in our widely deployed telecommunication, edge computing, network appliance, storage, and private cloud server products.

Our in-house developed software tools provide the following benefits to our customers:

System Management
Advantech platform software can work as a daily doctor to keep your x86 system stable. Our solutions monitor health status, provide multiple alarm channels, and control the system through different interfaces like CLI and RESTful API, system recovery, or remote firmware updates and diagnostics instead of time-consuming RMA.

Remote Management
Providing device support on site can be time-consuming and costly. But how do you manage distribution of thousands of device at once? Advantech platform management works independently from the OS and can be done remotely from any location. With remote control, remote storage and upgrades a via web interface, you can provide an efficient service from anywhere with less maintenance and operation costs.

Enhanced Security
Advantech continues to develop up-to-date secured technology such as Redfish which is the next generation platform management alternative to IPMI, introducing RESTful APIs and secure communication. Advantech also passes and meets different security scans (e.g. Nessus, NMAP, etc.) and compliance to meet common international laws and guidelines (e.g. NIST SP 800-193). All security features empowered by Advantech platform management can help you to reduce service impact, security risk, maintenance cost, and improve service levels.

High Availability
Advantech hardware with integrated software solution provides fail-safe mechanisms, which help avoid any single points of failure and thus provide high availability, even on standard configurations. Based on Advantech's experience in the telecommunication and network security space, all these designs offer close to zero downtime, improve system availability, and reduce operation costs.
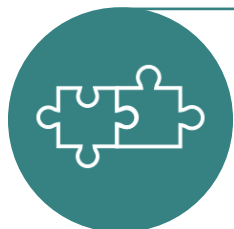
Application Flexibility
Advantech's in-house solution provides full capability to maintain all aspects of development and create flexible options for easy customization, quick response time, and online utility licensing. Our verified solution can offer unique ID branding at the customer's request, within certain service level agreements. Our customization helps service providers and enterprises bridge the gap between ODM and standard products to speed up time to market.

All these systems, features, and tools have a moderate impact on cost as they have been carefully designed by Advantech's in-house engineering teams and are kept consistent across Cloud IoT products. All in all, our goal is to enable customers to have a secured platform management solution to maintain their network appliances and servers in an agile and cost-efficient manner.

Our in-house developed platform management and software tools include:

Advantech Platform Management is an in-house designed and developed carrier-grade Baseboard Management Controller (BMC) solution with Redfish support that provides secure local and remote control functions. Advanced Platform Management features include redundant BIOS and firmware images for fast recovery and fail-safe updates using industry standard protocol HPM.1, which is built into the redundant carrier-grade Baseboard Management Controller (BMC).

Remote Monitoring & Control	Remote Update	Redundant Firmware	Failsafe Update	Chassis Intrusion Detection	Digital Inventory	Service-friendly Design

Advantech Server iManager is the new brand name for the Linux based Cloud-IoT platform of software utilities and APIs. Advantech Server iManager can identify network ports, monitor hardware health status with alarm channels for different users and much more. With this information, customers can prepare backup plans and maintain system stability. Customers can quickly clarify their hardware or application issues by using diagnostics to shorten mean time to prepare replacements or initiate a proper repair plan instead of time-consuming RMA procedures. Server iManager allows users to integrate these OS based tools into their service via various popular interfaces like CLI and RESTful API.

24H Monitoring	Alert	Diagnostics	Network Port Identification	Integration with Different Services

SKY-EYE is one of the software solution which can be integrated with WISE-PaaS to monitor Advantech SKY servers, collecting all hardware information with user-friendly dashboard and alerting with operation guiding can improve business agility and reducing total cost of ownership (TCO).
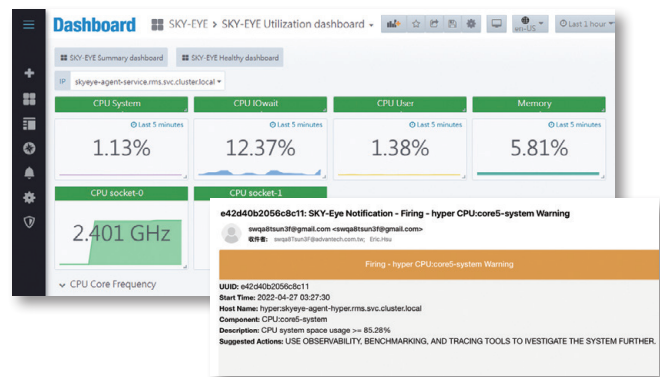
Advanced LAN Bypass is leading industrial hardware and software design on our network appliances and NMC/ PCIe cards that can be used for signal/traffic management or firewalls.

Safeguard the continuity of your business critical services by eliminating single points of failure with LAN bypass. Advantech's advanced LAN Bypass feature guarantees uptime by preserving network connectivity and maintaining communications in case of power outage or appliance malfunction. When Bypass Mode is active, multiple interface pairs can be bridged on power failure or appliance malfunction and will resume normal functionality when the issue is resolved.

Advantech Network Appliance as Traffic Management
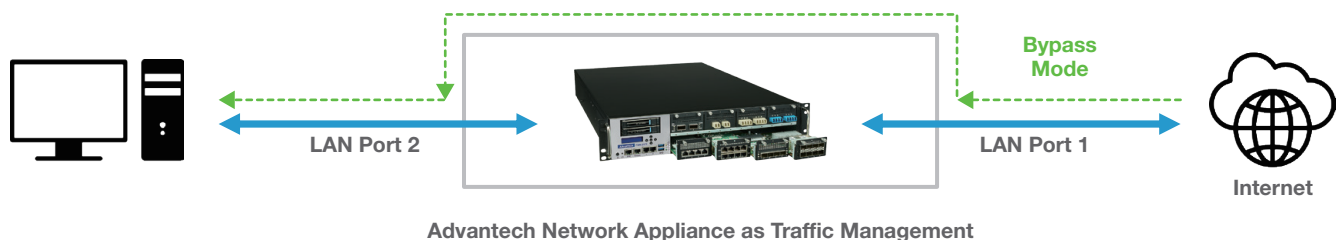
Premium Global Services

Manufacturing

Logistics

Customer Support

The foundation of our business is built on world-class manufacturing, quality, and integration processes that enable our customers to deploy reliable business-critical solutions worldwide with total confidence.

Deploying standards-based products that enable our customers to create industry leading solutions requires a full suite of high-quality products, advanced customization technology, an extensive ecosystem and a full complement of life-cycle services. Advantech's platforms, Customized COTS framework, Ecosystem Alliance Program, Remote Evaluation and Global Services meet these needs perfectly. We provide a comprehensive service package that integrates our key service models into a complete transaction process, from the manufacturing and system integration phase, global logistics and after-sales support. In order to create the maximum value for our customers, Advantech Global Services is the shortcut for transforming your projects into reality.

Manufacturing Capabilities

Our world-class manufacturing centers in Taiwan and China both maintain precise quality control, and offer a full range of cost-effective, state-of-the-art production capabilities. To maximize the efficiency of operational procedures, we have implemented a cluster manufacturing system within our segmented manufacturing service units. This unique approach enables a direct, simplified, and highly streamlined design-to-manufacturing process. We pride ourselves on our:

- In-house board, chassis, and system production capabilities
- Dual world-class manufacturing centers
- Advanced production capabilities and customizable processes
- Rigid quality assurance system
- Complete ISO standard coverage

We Build It Exactly as You Imagine It

Advantech provides full customization and branding services to integrate our innovative platforms with existing product lines and give them customers' look and feel. With our Configure-To-Order-Services we provide cost efficient services to build different system SKUs in our logistic centers around the world. Through these services we bring our clients the benefits of greater flexibility, lower inventory, shorter lead times and global reach with local touch at work.

International Quality Standards

The Group Quality system is audited and compliant with ISO 9001. The Quality system covers all aspects of product design, component selection, design verification, manufacturing, quality control and customer satisfaction. From the board of directors down, each member takes pride in providing our customers with the highest level of quality in products and services. We also hold global certifications of ISO 13485, TL 9000, ISO 14001, OHSAS 18001 and IECQ QC 080000.

Global Logistics Services

With strong integrated ERP and SAP supply chain solutions, our worldwide logistics network offers a wide range of flexibilities to bring out different delivery models including local and global solutions that meet your unique needs and budget requirements. Advantech's Logistics Service gives you the flexibility to simplify your logistical networks, bring your products to market on time, and enjoy a timely return on your investment.
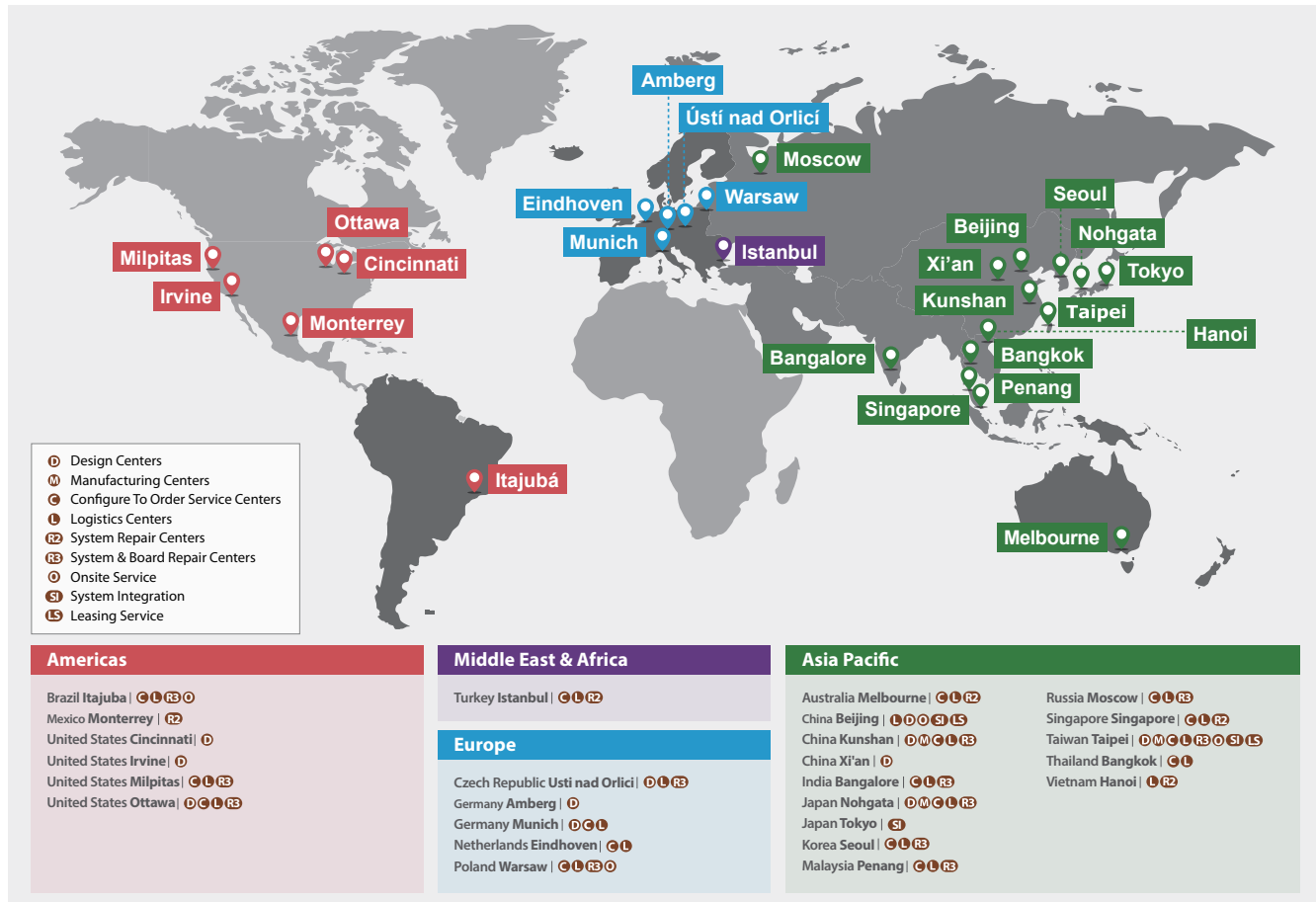
Customer Support Services

Our global presence provides localizable, customizable, and reliable customer support services that can be leveraged to create an optimized maintenance and support plan that helps reduce costs and proactively mitigate business risks. In addition to our complete technical and repair support, we provide a variety of customizable after-sales services, including extended warranty, advance replacement, upgrade, fast repair, etc. Our knowledgeable local support groups enable a consistent support experience around the world and help keep your investment at peak performance and within your budget.

- 24/7 technical support: hotline AE & online chat support
- Global deployment with local full-line repair capability
- Easy-to-use web-based repair and tracking system
- Various other value-added, after-sales support services

Global Operation Infrastructure and Logistics Network with Local Delivery

Advantech is located in 25 countries and 93 cities in each major operating region, offering a global reach with teams in many geographic regions. We support our customers through an extensive global network of offices and an industry-leading eBusiness infrastructure designed to provide responsive service that benefits clients anytime, anywhere.

Legend:
- D — Design Centers
- M — Manufacturing Centers
- C — Configure To Order Service Centers
- L — Logistics Centers
- R2 — System Repair Centers
- R3 — System & Board Repair Centers
- O — Onsite Service
- SI — System Integration
- LS — Leasing Service

Americas
- Brazil **Itajuba** | C L R3 O
- Mexico **Monterrey** | R2
- United States **Cincinnati** | D
- United States **Irvine** | D
- United States **Milpitas** | C L R3
- United States **Ottawa** | D C L R3

Middle East & Africa
- Turkey **Istanbul** | C L R2

Europe
- Czech Republic **Usti nad Orlici** | D L R3
- Germany **Amberg** | D
- Germany **Munich** | D C L
- Netherlands **Eindhoven** | C L
- Poland **Warsaw** | C L R3 O

Asia Pacific
- Australia **Melbourne** | C L R2
- China **Beijing** | L D O SI LS
- China **Kunshan** | D M C L R3
- China **Xi'an** | D
- India **Bangalore** | C L R3
- Japan **Nohgata** | D M C L R3
- Japan **Tokyo** | SI
- Korea **Seoul** | C L R3
- Malaysia **Penang** | C L R3
- Russia **Moscow** | C L R3
- Singapore **Singapore** | C L R2
- Taiwan **Taipei** | D M C L R3 O SI LS
- Thailand **Bangkok** | C L
- Vietnam **Hanoi** | L R2

Online Technical and Repair Services for Total Lifecycle Support

Our Post-Sales Repair Service is equal in importance to our Design and Manufacturing division. The service represents our commitment to provide comprehensive technical support after delivery of new products. Web-based eRMA System is a personalized portal system which offers real-time RMA status-tracking at all times, anywhere via the Internet. Through Advantech's worldwide Customer Support Centers, our clients can get regional technical support and repair services along with a stringent, dependable quality standard.

Six Ready-to-Go AdvantechCare Service Packages

(1) Extended Warranty Service:
Advantech provides 3-month, 6-month, and 1-to-3-year extended warranty service.

(2) Onsite Service:
Defective parts will be replaced with the same or higher quality components and Advantech also provide one-off onsite service by request.

(3) Fast Repair Service:
Commitment to repair the defective unit within 24 / 48 hours.

(4) Advanced Replacement Service:
Advantech provides advanced replacement service by 1-2-3 year contract and all parts are free of charge during the warranty period.

(5) Technology Update Service:
Upgrade, furnish, and refurbish your stock at a fraction of the new purchase cost. Customizable product revision management solution. Optimize system performance and extend equipment life cycles.

(6) Preventive Maintenance Service:
Advantech Preventive Maintenance Service preserves and enhances equipment reliability by replacing worn components before they actually fail.

Remote Evaluation Services

Get on the Fast Track to Deployment

Advantech's Remote Evaluation Service (RES) is designed to help you get ahead of the curve and rapidly evaluate next-generation technology on a wide range of network platforms that can emulate different deployment scenarios at different network locations. We work together with leading ecosystem partners so that you can:

Early evaluate and benchmark latest hardware and software technologies

Perform functional and interoperability testing

Get an early start on development while saving resources, time and money

RES puts virtual control of your own test lab at your finger-tips. You no longer need to incur the costs of shipping heavy freight around the world, purchasing expensive test rigs or breaking your back installing equipment in a lab which you probably wouldn't sit in anyway. The systems we propose are pre-integrated, application-ready platforms embedded in a qualified, dedicated, and secure network test environment. In addition, our Test-Drive Portals build a full-stack infrastructure platform where users can remotely evaluate network functions or application performance or interoperability for a particular configuration:

Bare Metal Evaluation: check out the performance gains achievable on next generation Intel and AMD CPUs and see how your software scales across cores. You can measure the acceleration which DPDK and Intel® QuickAssist offload can bring or or validate new AI acceleration technologies.

Test-Drive Portals: lower risks and reduce time-to-market of disaggregated solutions by remotely validating applications and use cases on a wide range of Advantech platforms powered by software from a rich ecosystem. You can early detect and remove performance bottlenecks and incompatibilities or simply compare throughput of compute-intensive applications running on an accelerated vs non-accelerated environment.

Get Solutions to Market Faster and at Lower Risk

The virtual infrastructure consists of several building blocks from different vendors that need to work together to form the consistent cloud-native architecture that runs the microservices. The tight relationship between all components makes collaboration a key element in deployment success. RES provides a powerful tool to address integration challenges and help eliminate performance uncertainties by enabling collaboration beyond basic ecosystem partnership. End-users and partners can remotely test application performance and interoperability on an open virtual environment and work collaboratively towards production-ready end-to-end solutions. RES also offers a powerful tool to support developers in their critical decision making process when designing high-performance, scalable, open software.

Performance and scalability: RES allows vendors and service providers to easily test how multi-threaded, multi-tenancy function scale out across multiple network nodes and optimize provisioning and mapping. The wide choice of white boxes, appliances and servers that can be deployed to implement the virtual edge makes RES a perfect tool to accelerate the selection process and choose the appropriate platform with the right price/performance point.

Interoperability and integration: RES helps simplify complex virtual-stack dependencies when testing application compliance with standard virtualized interfaces or the conformity of a particular virtualized configuration to guarantee portability. Partners can tap into RES to reduce time and costs of multi-vendor certifications. The joint effort of certifying that particular hardware or software products have been validated to work together is an common initiative that reduces integration risks and streamlines end-user's purchasing process.

Visit our Live Test-Drive Portals
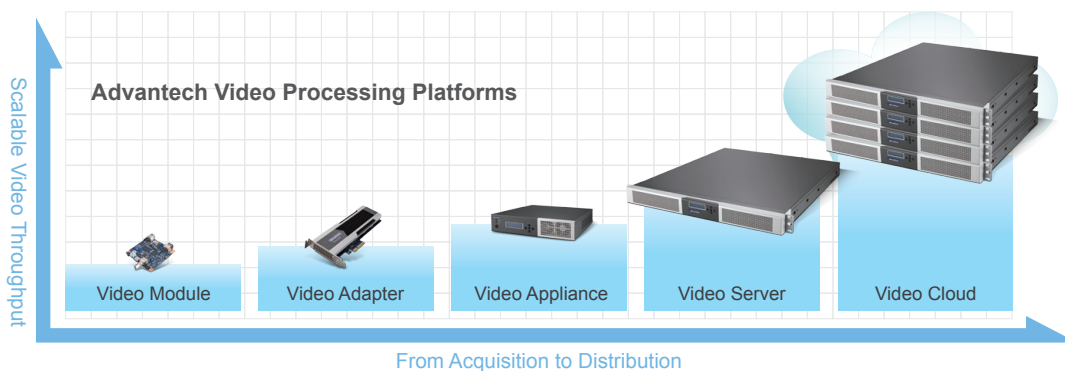www.go-res.com

Advanced Video Solutions
Accelerating UHD Workflow Transformation

Advantech's Video Solutions division has developed broadcast-quality video solutions for the top OEMs in the video/imaging industry. By adopting Advantech's video solutions, customers can harness our industry knowledge and edge computing and networking design skills to accelerate the deployment of next-generation media solutions.

	Contribution & Live Production	Media Processing & Distribution
Video Acceleration	▪ Supports various mezzanine compression formats for transporting 4K video over 10GbE	▪ Efficient HD/UHD H.264/H.265 encoder, decoder and transcoder PCIe acceleration for higher density, lower TCO deployments
Networking	▪ IP media transport supporting different industry standards such as SMPTE 2022 and SMPTE 2110	▪ Low latency media-over-IP interfacing & switching ▪ Software-defined networking & ToR switching
Computing	▪ Ethernet, SDI,HDMI, USB, and analog interface flexibility ▪ Embedded computing solutions for field applications	▪ Application-ready x86 platforms optimized to run compute-intensive video processing applications ▪ FPGA expertise for innovative IP integration

By leveraging our extensive industry experience and technical knowledge, Advantech develops innovative solutions that address specific customer needs. Starting in the design phase through to quality assurance, production, and global logistics, Advantech works with customers to create a collaborative environment for developing innovative solutions.

Advantech's scalable video platforms are designed for modular functionality to support a wide range of application scenarios. From ultra-lightweight modules that can be embedded into live streaming devices to high-density architectures developed for live cloud-based media services, Advantech's video processing platforms provide a software framework that simplifies integration with IP workflow solutions.

Scalable Video Throughput

Advantech Video Processing Platforms

Video Module · Video Adapter · Video Appliance · Video Server · Video Cloud

From Acquisition to Distribution
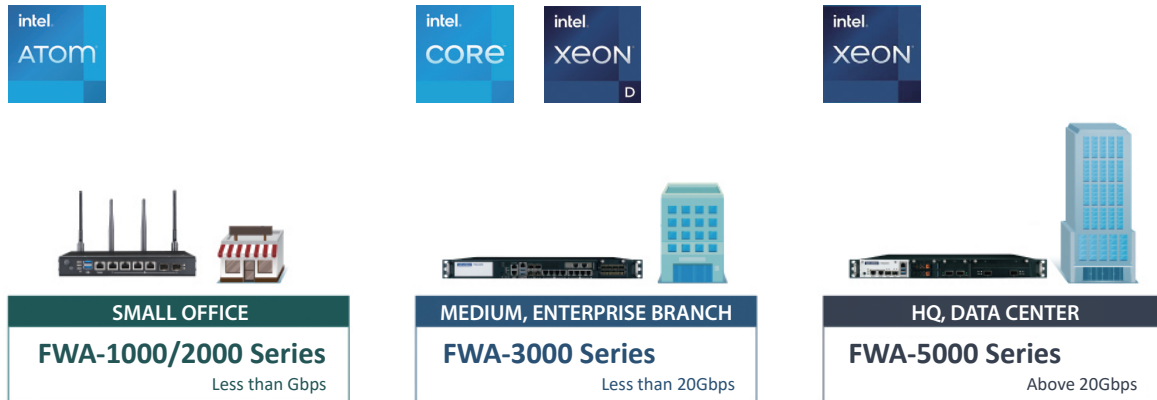
Simplifying Solution Customization

Advantech has invested substantial resources into developing the essential building blocks of integrated video infrastructure, including video acquisition, transport, processing, and distribution technologies. With Advantech, customers are not limited to standard product offerings. Our flexible design approach allows OEMs to easily customize Advantech's commercial off-the-shelf products through our Customized COTS service. The advantage is that this provides customers with the "best of both worlds". OEMs can distinguish themselves with unique products that leverage the cost benefits of custom ODM design and accelerate time to market. Supported by our world-class team of video architects and engineers, Advantech also welcomes full customization design and joint development projects according to customer requirements.

Commercial-off-the-Shelf (COTS)	Customized COTS	Joint Development Model	Original Design Manufacturing (ODM)

Standard ——————————————————————————— **Full Customization**

- ▪ Based on Advantech's standard product and technology roadmap with minor changes
- ▪ Co-architected-design based on common IP from converging product and technology roadmaps
- ▪ Based on customer product and technology roadmaps
- ▪ Strategic partnership
- ▪ Customer-driven design

SD-WAN, SASE & uCPE
Universal Edge Platforms for Cloud Native Enterprises

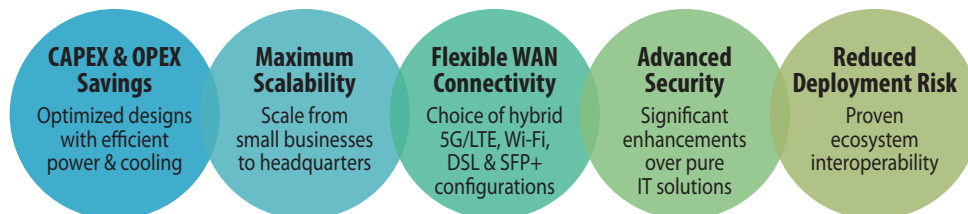| SMALL OFFICE	MEDIUM, ENTERPRISE BRANCH	HQ, DATA CENTER
FWA-1000/2000 Series	**FWA-3000 Series**	**FWA-5000 Series**
Less than Gbps	Less than 20Gbps	Above 20Gbps

Advantech Edge Appliances provide a solid and open foundation for service providers and enterprises to deploy agile and secure network solutions that break away from monolithic architectures. These scalable white boxes integrate latest computing and networking technologies into optimized edge platforms that are widely deployed running popular SD-WAN, security and uCPE software from industry leading ecosystem partners. This flexible approach to enterprise networking allows for disaggregated strategies that minimize supply chain risks and protect network investment — building an open and virtual infrastructure ready and adaptable to next generation converged and cloud-native models.

Advantech Universal Edge Appliances streamline enterprise network transformation with commercial-off-the-shelf white-box platforms that can scale enterprise secure connectivity services from small and medium branches to large premises and headquarters. Our networking platforms have been specifically designed to run high-availability telecommunication services to minimize costly downtime and service interventions. They integrate innovative features and are supported by a global service network for a competitive edge. Advantech works closely with leading virtualization, uCPE, SD-WAN, SASE and security partners to foster technology teamwork, interoperability testing and solution development. Proven product interoperability means customers can rapidly deploy tested combinations of hardware and software components with total confidence.

The Appliance Advantage

Although standard IT servers may be considered for deployment of network functions on the customer premises, white-box appliances offer a reduced CAPEX alternative for deployment in volume. Advantech's offering embraces CSP disaggregation strategies and enables a more cost effective separation of hardware and software in the provisioning of zero-touch appliances installed at customer branch offices.

CAPEX & OPEX Savings	**Maximum Scalability**	**Flexible WAN Connectivity**	**Advanced Security**	**Reduced Deployment Risk**
Optimized designs with efficient power & cooling	Scale from small businesses to headquarters	Choice of hybrid 5G/LTE, Wi-Fi, DSL & SFP+ configurations	Significant enhancements over pure IT solutions	Proven ecosystem interoperability

Advantech's open white-box approach, using standard x86 processors in feature-flexible appliances, provides the range of bare-metal server platforms needed by CSPs and system integrators to transform conventional deployment models in the enterprise WAN.

Visit **www.ucpe.tech** to find out more about our enterprise networking and the ecosystem partners that enable end-to-end solutions

Network Security

Excel to Protect Your Customers

Network security evolves as rapidly as new threats spread. Security applications protect services and users in a variety of network deployments with different architectures. However, they all share a basic requirement: complete visibility and control over traffic crossing the network. Applications such as intrusion detection and prevention, SSL inspection, Unified Threat Management or next-generation firewalls need to capture 100% of the traffic across all packet sizes without risking any data. They therefore strongly relying on Deep Packet Inspection (DPI) techniques to accurately classify network traffic. Traditional DPI stops at application identification but the latest application-aware solutions can classify both enterprise and consumer applications and protocols, and extract valuable insights up to Layer 7.

Network security equipment vendors need solutions able to perform packet processing at wire speeds on 100G/40G/25G/10G ports as well as on legacy gigabit Ethernet ports. In addition, their network application platforms need to be scalable and flexible in order to adjust to evolving requirements such as increases in network bandwidth, application performance, and the virtualization of security functions. To achieve this, network security vendors are investing more and more in application software development and require flexible, scalable, and high performance platforms to deliver their solutions. From their perspective, any appliance upon which their network applications are delivered must meet and exceed strict performance criteria, reduce overall development costs, and accelerate time-to-market.

Network Throughput from Mbps to Tbps

Advantech's communications platforms provide scalability and reliability with the broadest range of communication platforms based on Intel® architecture scaling from megabits to terabits per second throughput. Our desktop and 1U rackmount server platforms meet the needs of UTM solution providers supplying small to medium businesses as well as large enterprises. For large enterprise solutions requiring the fastest of security appliances, Advantech's high end platforms scale from 2U rackmount appliances all the way up to multi-bladed server solutions offering scalable performance for data center and telecom network security, where customers need terabits per second of processing performance.

<10Gbps   25Gbps   100Gbps   200Gbps   400Gbps   800Gbps
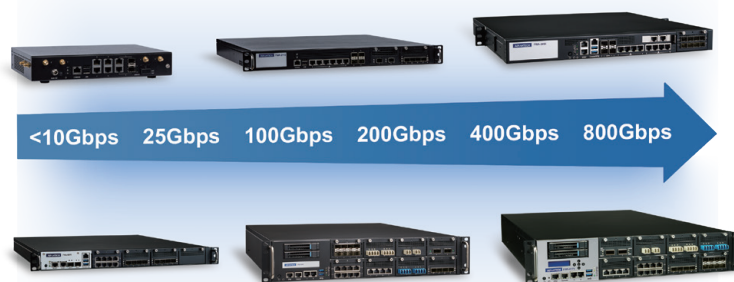
We help accelerate time-to-market by working closely with major processor and network interface vendors on early silicon to ensure we have the latest technology available for the earliest possible customer sampling. By working in close unison with silicon vendors we are able to provide platforms, blades and accelerators which give our customers an advantage and allow them to deploy solutions in volume as soon as production level silicon is available.

Intel® QuickAssist & Data Plane Development Kit (DPDK)

NPU-like packet processing performance is attained by leveraging the performance-optimized libraries in the DPDK to speed up packet processing and increase throughput. The platform integrates Intel® QuickAssist Technology, a set of software modules for bulk encryption, data compression, and other workloads critical to networking. As acceleration hardware embedded within the chipset or add-in modules are available, compute-intensive algorithms can be off-loaded from the CPU cores, freeing up processor cycles for application and control processing.

What's more, you can tap into Intel® architecture with the guarantee of proven software compatibility spanning multiple processor generations allowing you to commit to any platform today with the assurance your software investment is securely future-proofed. Scalability makes it simpler to design a range of products using a common software base starting with desktop appliances for SMB security and ranging to UTMs and policy enforcement engines leveraging DPDK and Intel® QuickAssist Technology in next-generation network platforms.

Inference Edge Solutions
Leading the Industrial Edge Digital Transformation
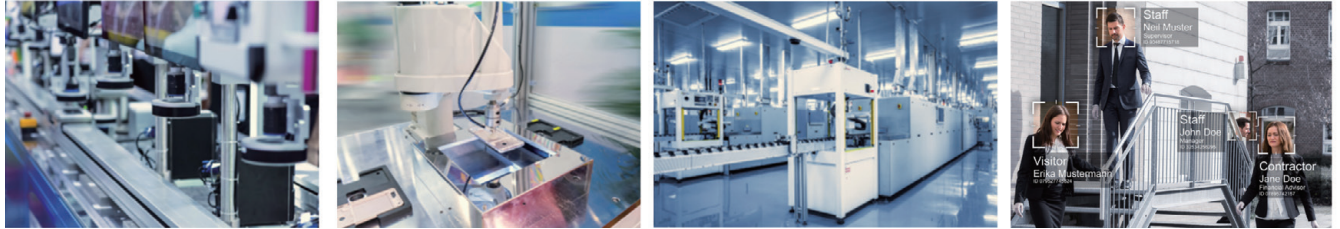
Internet of Things (IoT), artificial intelligence (AI) and high-performance computing (HPC) are transforming advanced manufacturing. Industry leaders are directing efforts towards enhancing digitization in automation and manufacturing as they seek change that engenders sustainable manufacturing in the factories of the future. When the computation is moved as close to the source of data as possible, there is a rapid increase in high quality date at the edge and massive amounts of data waiting to be consumed. Using a traditional "cloud computing" model requires all this data to be transmitted back to a centralized data center to be processed, before being transmitted back to the device.

Edge Accelerator Servers (HPC-6 + ASMB-6 series) bring high computation capability, enrich expansion possibility, and bring small form factor high-density design to the edge of the network. This puts them physically, logically, or geographically close to the end device, thereby reducing network bandwidth usage and latency and shortening response times.

The Edge Accelerator Server (HPC-6 + ASMB-6) series are powered by Intel® Xeon® Scalable processors, Intel® Xeon® W Processors and Intel® Core™ Processors and support up to 11 cards for AI acceleration such as NIC cards, frame grabbers, RAID cards and more. Each Edge Accelerator Server supports up to 2 double-deck GPU cards or 4 single-deck GPU cards for a wide array of applications across a diverse range of industries, such as IEM, machine vision, factory automation, artificial intelligence (AI), smart cities, medical technology and more.

Advantech SKY-6000 series of GPU powered rackmount servers offer massive parallel computing power and unrivaled networking flexibility. They are designed to deliver ample processing power for the most computationally-intensive applications. GPU-accelerated computing takes advantage of the massive parallel architecture of GPU for compute-intensive tasks, while the rest of the application code runs on the CPU. SKY-6000 servers are powered by Intel® Xeon® Scalable processors, with NVIDIA-certified systems, which can support up to 10 x NVIDIA® GPUs. This maximizes the acceleration of parallel computing applications, including AI, deep learning, self-driving cars, smart cities, medical, big data, high performance computing, and virtual reality (VR).

Workstation

- ● Single Deck
- ● Double Deck

x4 x2
HPC-7420+ASMB-976

x2 x1
HPC-6120+ASMB-610

x4 x2
HPC-6240+ASMB-622

Intel Core / Xeon W

Data Center

x8 x4
SKY-6200

x8 x4
SKY-640V2

x5 x1
SKY-6100
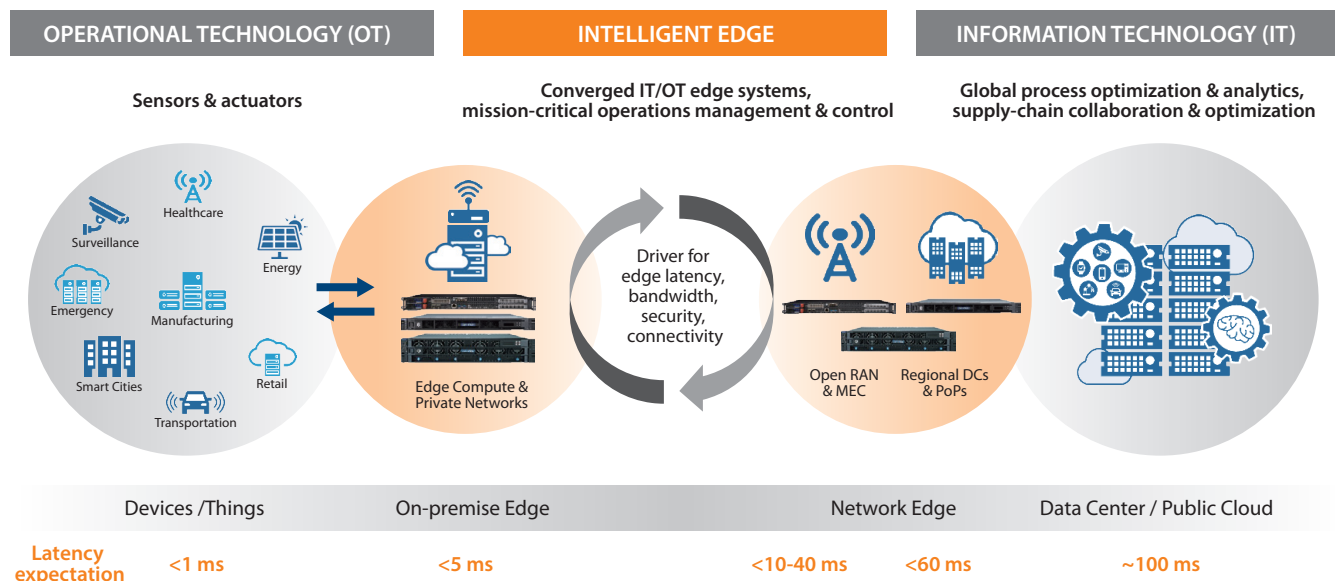
x10
SKY-6420

Intel Xeon Scalable

5G Open RAN & Edge Computing

Extend Your Reach with Advantech's Micro-Datacenter-in-a-Box

The next wave of innovation in the communications industry that introduces new concepts such as real-time interactive services or the Internet of Things (IoT) is redefining the network edge role. The combination of 5G Open RAN, Artificial Intelligence (AI) and Multi-access Edge Computing (MEC) has the potential to transform the digital experience as it allows applications to seize user's proximity to provide low latency and high bandwidth benefits. Equipment manufacturers, developers and service providers are co-working to enable this new intelligent edge where diverse access protocols co-exist with revenue generating applications. The result is a decentralized and elastic architecture using cloudlets at the edge of the network as an intermediary processing stage to avoid the costs of transporting large amounts of data back to the cloud.

As the industry seeks to accelerate the delivery of these new services at the edge, it is vital that Communication Service Providers (CSPs) optimize infrastructure for density and cost leveraging existing brown field sites where possible. Advantech SKY-8000 series of 5G Edge Servers is designed to efficiently meet increasing edge computing trends by bringing higher aggregate compute performance closer to the user while fully complying with telecom industry equipment practices. It extends the same programming and deployment environment of the datacenter to central offices, aggregation sites or base stations, taking a micro-datacenter-in-a-box approach that packs 3rd Gen Intel Xeon Scalable processors and latest acceleration technologies in short-depth platforms that meet high availability network needs.

Building a Competitive Edge with SKY-8000 Servers

OPERATIONAL TECHNOLOGY (OT)	INTELLIGENT EDGE	INFORMATION TECHNOLOGY (IT)
Sensors & actuators	Converged IT/OT edge systems, mission-critical operations management & control	Global process optimization & analytics, supply-chain collaboration & optimization

	Devices /Things	On-premise Edge		Network Edge	Data Center / Public Cloud
Latency expectation	<1 ms	<5 ms	<10-40 ms	<60 ms	~100 ms

Carrier-Grade Platforms Designed for Five 9's Availability

Advantech has designed the SKY-8000 series for next generation carrier networks with a number of objectives in mind:

- Help service providers to evolve from closed proprietary solutions to **open and seamless cloud-native architectures** running microservices on off-the-shelf servers anywhere in the network.

- Ensure **carrier-grade availability** and conformity to standards such as NEBS in order to accelerate brown field deployment in the network edge.

- Facilitate the deployment of Open RAN by providing a platform **optimized for DU deployment** to integrate the required highdensity vRAN acceleration, I/O and time synchronization technologies while optimizing performance per watt.

- Provide the flexibility needed now to deploy new cloud-native applications and services, paving the way to 5G, Edge AI and the Internet of Things (IoT).

Hyperconverged Infrastructure (HCI)
Achieving Superior Flexibility and Scalability

The continued proliferation of hyper converged infrastructure (HCI) owes its growth in equal parts to HCI's clear technology merits and the dynamic evolution of our global network from the data center to the edge. The efficiencies that HCI strategies and solutions provide – in cost, deployment, and scalability – make them ideally suited to accommodate shifting network and computing requirements as compute infrastructure is distributed ever farther away from our central data center hubs, and ever deeper into regional and/or remote geographies. HCI – particularly when deployed far from the data center core – brings data, content and AI guided decision-making agility closer to the end users and end infrastructure where it's needed. This is achieved with an easy-to-scale model that prioritizes reliability and resiliency – and flexibility, most of all – at ultra-efficient cost structures.

HCI Core Benefits

HCI is broadly defined as an approach to ICT architecture that combines computing, storage and networking in a single system, simplifying IT environments while simultaneously making them more adaptable in their ability to accommodate a wide range of applications and workloads. HCI prioritizes elasticity and scalability, and can be flexibly deployed and maintained in a simplified manner. As ICT infrastructure and data traffi c spreads progressively outward from our core datacenters, there will naturally be decreased bandwidth capacity, rack space, power and IT staff resources to service it. HCI is therefore optimized to maximize computing, storage and networking effi ciencies in a dense, low power system profi le that's highly modular, reliable and secure.

Sky High Innovation with AMD

HCI features and functionality are designed for maximum versatility, accommodating almost any workload from data center to edge – sophisticated in capability, yet simple to deploy and manage. This is an extremely careful balance to achieve – and it requires significant HCI experience and expertise.

SKY-7260S3P

Advantech has taken these and other key considerations into account in the design of its SKY-7260S3P server and storage platform for HCI, the latest entry in Advantech's SKY series of industrial server solutions spanning HCI, storage servers, edge servers and more. Based on AMD EPYC™ 7543 CPUs, Advantech's SKY-7260S3P is a fully featured, single socket server for virtualized workloads and HCI deployments.

The SKY-7260S3P supports high memory capacity up to 2TB for extraordinary memory throughput coupled with large I/O throughput leveraging up to 128 lanes of PCIe Gen4. This is complemented with powerful compute spanning up to 64 AMD "Zen 3" cores, high storage capacity up to 200TB (all HDD configuration), and networking flexibility via 10G SFP+ and 10GBase-T OCP mezzanine modules. Advantech's SKY-7260S3P delivers outstanding price/performance benefits and almost 2X less power consumption.

Advantech's proprietary BMC management platform provides a reliable server and secure environment for next-generation AI-driven ICT infrastructure. This is complemented by AMD Secure Memory Encryption (SME) and Secure Encrypted Virtualization (SEV) to provide state-of-the-art security features and a, reliable HCI server platform designed with enterprise- class robustness for the AI and IoT-driven compute requirements of tomorrow.

Data Center Storage Performance
Multi-node Server Boosts Secondary Storage Applications

Data-centric services and applications are booming in all domains. Both end-users and enterprises are seeking data services with larger capacities and higher performance. These services are intended for data storage and analysis, and are the basis of many service-driven business models. The demands for these services has increased server, computing, and storage performance requirements.

While storage is important—performance, reliability, and scalability remain critical considerations. Therefore, adopting expandable hyper-converged infrastructure and scale-out capabilities according to application needs is highly valued within this market. Likewise, hot-swappable field-replaceable units (FRU) and redundant designs that ensure the continuous operation, are similarly essential trends in data service applications.

Ensuring service quality and development flexibility is a priority for data service providers. These providers seek fast-deployment, high-density server hardware systems that are easy-to-maintain. Using redundant designs is an essential consideration when building a stable system. Therefore, the power supply, cooling fans, storage, and other important components require redundant functionality. Likewise, failover settings are essential. Current mainstream data service server architectures are a combination of high-speed NVMe SSDs and high-capacity HDDs. This architecture balances capacity, performance, and cost.

Advantech SKY-9240C is a 2U4N rackmount multi-node server that supports four independent systems with individual boxes enabling multiple functions. The total configuration utilizes up to 8 x CPUs, 4 x PCIe cards, and 4 x OCP Mezz, to deliver excellent flexibility and scalability, while yielding a reduced total cost of ownership. SKY-9240C is designed for hyper-converged infrastructure and high-performance computing applications. This solution's hot-swapping capability allows HDD/SSD tray, cooling fans, MB/Node sled, and power supplies to be replaced without an interruption in service.

To provide 24 hours of uninterrupted data service operation and improve reliability, SKY-9240C utilizes numerous redundant components including a redundant PSU and cooling fan (dual-rotor 8 cm/3.14 in). SKY-9240C is equipped with a self-developed dual/failover BIOS & BMC design. Advantech designed this BMC to furnish data service providers with unique functions that help manage the whole system. SKY-9240C delivers the best customized tuning and meets the unique product needs of data service providers.

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Network Appliances

Network Appliances

Advantech offers a broad portfolio of x86-based Network Platforms built with the latest generation Intel® processors, LAN access devices and accelerator silicon for SSL and IPsec encryption. Integrated into state-of-the-art tabletop and rackmount designs, a range of customized branding options are available for fast and efficient deployment. The platforms range from cost-efficient and compact tabletop solutions to higher performance 1U rackmount server designs and scalable 2U Enterprise/Data Center level platforms. Specifically designed to meet the requirements of Network Equipment Providers (NEPs), Cyber Security OEMs, and Communication Service Providers, the platforms are highly scalable and configurable with flexible port counts across a wide range of 1GbE, 10GbE, 40GbE and 100GbE options.

Advantech platforms are deployed in volume around the world in a wide range of applications for network and cyber security in the form of Unified Threat Management (UTM) appliances, Intrusion Prevention and Detection (IPS / IDS) devices, Next Generation Firewalls (NGFW) and Security Gateways (SeGW) among others. They are ideally suited for enterprise applications such as vE-CPE and SD-WAN, and widely used as physical appliances such as load balancers, application delivery controllers (ADC), WAN Optimization Controllers (WOC) and VPN gateways.

Scalability by Design

Advantech works to realize Communication Service Providers' scalability goals by providing solutions based on Intel® architecture where individual systems can be easily expanded with new hardware options and across compatible product families ranging from table-top appliances all the way up to 1U and 2U rackmount solutions. Building a product portfolio that can indeed do this requires an underlying hardware architecture that can support a consistent and cohesive software framework that in turn is able to scale up based on the functionality and capacity requirements. A silicon partner like Intel®, delivering dependable year over year performance and feature improvements using world leading process technology is a key enabler in these fast paced times.

At the foundation of Advantech's portfolio is the Intel® Platform for Communications Infrastructure. Specifically designed for workload consolidation, it is capable of performing application, control plane, and data plane processing concurrently with scalable security performance to over 100 Gb/s of IPsec acceleration.

Enhanced Platform Management Lowers Total Cost of Ownership

Advantech's network appliances have been specifically designed to run high-availability networking services and minimize costly downtime. Advantech's Advanced Platform management provides all required IPMI v2.0 Baseboard Management Controller (BMC) functionality and also additional features that allow local and remote users to early detect system degradation, avoid system interruption and shorten mean time to repair.

Pay-as-you-Grow with Advantech's Modular I/O

8-port 1GbE
4-port 10GbE
2-port 40GbE
2-port 100GbE
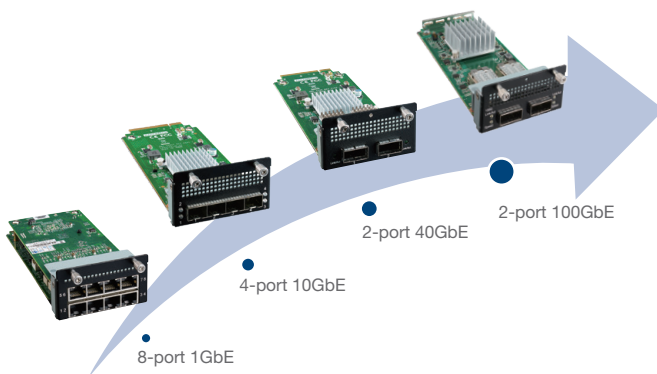
Advantech's Network Mezzanine Cards (NMCs) are cost-optimized, high density I/O modules for use in Advantech's appliances. A wide choice of 1GbE, 10GbE, 40GbE and 100GbE modules supporting copper and fiber interfaces with or without advanced LAN bypass gives customers the flexibility to match varying deployment scenarios. At the same time, Advantech's modular I/O approach reduces the total cost of ownership and service cost via re-usability across the product range and multiple product generations. The option of factory and field installation enables upselling opportunities and pay-as-you-grow concepts. Leveraging best-in-class Intel® Ethernet controller technology, NMCs provide a "it just works" user experience and a maximum of software compatibility.

Network Appliances

Model		☞ FWA-T011	☞ FWA-1010VC	☞ FWA-1011	☞ FWA-1012VC
Form Factor		Tiny box	Tabletop	Tabletop	Tabletop
Processor System	Processor	Intel® Celeron® N3350/J3455	Intel™ Atom™ C2558/C2758	Intel® Celeron® J3355/J3455	Intel™ Atom™ C3338/C3558/C3758
	Core Count	2C/4C	4C/8C	2C/4C	2C/4C/8C
	Frequency	1.1GHz/1.5GHz	2.4GHz/2.4GHz	2.0GHz/1.5GHz	1.5GHz/2.2GHz/2.2GHz
	L2 Cache	2MB	2MB/4MB	2MB/2MB	≤8C 2MB/Core; >8C 2MB/Core Pair
	BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Virtualization		VT-x, VT-d	VT-x	VT-x, VT-d	VT-x, VT-d
Memory	Technology	DDR3L 1600/1866MHz	DDR3/DDR3L 1600MHz	DDR3L 1333/1600/1867MHz	DDR4 2400MHz
	Max. Capacity	8GB	32GB	8GB	64GB
	Socket	1 x 204-pin SO-DIMM	2 x 240-pin DIMM	1 x 204-pin SO-DIMM	1 x 288-pin DIMM for 2 core 2 x 288-pin DIMM for 4/8 core
	ECC Support	–	Yes	–	Yes
Networking	Controller	4 x Intel i210	3 x Marvell 88E1112, 1 x Marvell 88E6141	6 x Intel i211-AT	1 x Intel i350, 1 x Marvell phy 88E1543
	1GbE	4 x GbE RJ45	2 x 1GbE RJ45 via Marvell 88E1112 / 2 x 1GbE SFP via Marvell 88E1112 1 x 1GbE RJ45 via Marvell 88E1112 4 x 1GbE RJ45 via Marvell 88E6141	6 x 1GbE RJ45 via i211-AT	2 x 1GbE RJ45 and 2 x SFP via Intel I350 4 x 1GbE RJ45 ports via Marvell 88E1543 (2 POE+)
	10GbE	–	–	–	–
LAN bypass	Advanced	–	–	–	–
	Legacy	–	–	1 x pair of LAN Bypass	–
Expansion Slots	NMC	–	–	–	–
	M.2 (Except SSD)	1 x 2230 WiFi/BT module 1 x 3042 3G/4G LTE module	1 x 2230 WiFi module	1 x 2230 WiFi/BT module 1 x 3042 3G/4G LTE module SSD (Optional)	1 x 3042 LTE module (Optional: 1 x 2242 SATA)
	Mini PCIe	–	1 x full-size 3G/4G LTE module	–	1 x half-size and 1 x full-size WiFi module
	SIM Socket	1	1	1	2
Storage	2.5" Bay	–	1 x 2.5" SSD (9.5mm height, C2758)	1 x 2.5" SSD	1 x 2.5" SSD (9.5mm height, C3758)
	3.5" Bay	–	–	–	–
	M.2	1 x 2280 SATA	1 x 2280 SATA 2 x 2242 SATA (Optional)	1 x M.2 2260 or 2242	1 x 2242/2280 SATA/PCIe Gen3 x1 (Optional: 1 x 3042 LTE)
I/O	Console	1	1	1	1
	USB 3.0	–	–	1	2
	USB 2.0	2	1	1	-
	LED Indicator	Power, HDD, 4G LTE, WiFi, Software-defined	Power, HDD, 4G LTE, WiFi, Software-defined	Power, HDD, 4G LTE, 6 pairs LAN, WiFi & LTE	Power, HDD, 4G LTE, WiFi, Software-defined
	Display Interface	HDMI	–	HDMI	–
	Button	1 x Power Switch 1 x Software-defined button	1 x Power Switch 1 x Software-defined button	1 x Power, 1 x Reset	1 x Power Switch 1 x Software-defined button
TPM		TPM1.2 or TPM2.0 (Optional)	Optional by module: 98923260H0E	TPM 1.2 or TPM 2.0 (Optional)	TPM1.2 or TPM2.0 (Optional)
Power Supply	Power Type	DC	DC	DC	DC
	Watts	36 W	60 W	40 W	36 W for 2 core 60 W for 4/8 core
	Input	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V
	Connector	DC Jack	DC Jack	DC Jack	DC Jack
	Power Adapter	12V 3A, 36W external adapter	12V 5A, 60W external adapter	40W external adapter	12V 5A, 60W external adapter
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Vibration Resistance	SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis	SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis	SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis	SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis
	Shock Protection	SATA SSD: 10G, half sine, 11ms duration	SATA SSD: 10G, half sine, 11ms duration	SATA SSD: 10G, half sine, 11ms duration	SATA SSD: 10G, half sine, 11ms duration
	Cooling	Fanless	1 x system fan with smart fan	Fanless	2 x system smart fan (8core SKU) or 2 x system smart fan (2/4core SKUs)
Mechanical	Construction	Steel	Steel	Steel	Steel
	Mounting	Desktop/Rackmount optional	Desktop/Rackmount optional	Desktop	Desktop/Rackmount optional
	Dimensions (W x H x D)	152 x 21 x 125 mm (6.0" x 0.83" x 4.92")	250 x 44 x 190.4 mm (9.84" x 1.73" x 7.5")	210 x 38 x 150 mm (8.27" x 1.50" x 5.9")	250 x 44 x 190 mm (9.84" x 1.73" x 7.48")
	Weight	0.7 kg (1.54 lbs)	2.3 kg (5.1 lbs)	1.8 kg (4.0 lbs)	2.3 kg (5.1 lbs)
OS Support		Linux, Windows 10	Linux, Windows 10	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages		QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; Sierra QMI drivers; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: DUI (Offline Diagnostics)	QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; Sierra QMI drivers; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: DUI (Offline Diagnostics)	QuickStart Linux Image (CentOS based reference BSP): afru; Advanced LAN Bypass Utility; Intel DPDK	QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; Sierra QMI drivers; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: DUI (Offline Diagnostics)
IPMI		–	–	–	–
Certification		CE, FCC Class B, CCC, CB, UL	CE, FCC Class B (with RF), CCC, CB, UL, BSMI, KCC, VCCI, RCM, BIS	CE, FCC Class B, CCC, CB, UL (NOT Include any RF certificate)	CE, FCC Class B (with RF), CCC, CB, UL, CE-RE

Note: "-" = Not Applicable

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Model		☞ FWA-1013	☞ FWA-1112VC	☞ FWA-1211	☞ FWA-1320
Form Factor		Tabletop	Tabletop	Din Rail	Tabletop
Processor System	Processor	Intel® Atom™ C5315/C5325/ P5322/P5332/P5342	Intel® Atom™ C3338/C3436L/ C3558/C3758	Intel® Atom™ E3940/E3930	Intel® Atom™ C2358/C2558
	Core Count	4C~8C (C5300), 8C~24C (P5300)	2C/4C/8C	2C/4C	2C/4C
	Frequency	1.6GHz~2.4GHz (C5300), 1.6GHz~2.2GHz (P5300)	1.6GHz/1.3GHz/2.2GHz/2.2GHz	1.3GHz/1.6GHz	1.7GHz/2.4GHz
	L2 Cache	2MB/2MB	2MB/2MB	2MB/2MB	1MB/2MB
	BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Virtualization		VT-x, VT-d	VT-x, VT-d	VT-x, VT-d	VT-x
Memory	Technology	DDR4 2400/2667/2933MHz	DDR4 1866/2133/2400MHz	DDR3L 1333/1600/1867MHz	DDR3/DDR3L 1600MHz
	Max. Capacity	256GB	32GB	8GB	16GB
	Socket	1 x 288-pin RDIMM	1 x 260-pin SO-DIMM	1 x 204-pin SO-DIMM	2 x 240-pin DIMM
	ECC Support	Yes	Yes	Yes	Yes
Networking	Controller	1 x Intel i350-AM4; 2 x Intel i226; 1 x Marvell phy 88E1543	2 x Intel i211; 1 x Marvell phy 88E1543	3 x Intel i210-AT or 5 x Intel i210-AT	2 x Intel i210, 4 x Marvell 88E1111
	1GbE	4 x GbE RJ45 from I350-AM4 2 x 2.5GbE RJ45 from i226	2 x 1GbE RJ45 via Intel I211 4 x 1GbE RJ45 via Marvell 88E1543 or 2 x 1GbE RJ45 via Marvell 88E1543 plus 2 x SFP+ via SoC	3 or 5 x 1GbE RJ45 via i210-IT plus 2 x SFP via i210-IS	4 x 1GbE RJ45 via Marvell 88E1111 (2 segment advanced bypass) 2 x 1GbE RJ45 for management via Intel i210-AT
	10GbE	4 x 10G SFP+ via SoC	2 x 10G/1G SFP+ via SoC		
LAN bypass	Advanced	2 pairs of LAN bypass (Optional)	–	1 or 2 pairs of LAN bypass (Optional)	2 x segment (4 x ports)
	Legacy	–	–	1 or 2 pairs of LAN bypass	–
Expansion Slots	PCIe x8	1 x Gen3 x8	–	–	–
	NMC	1	–	–	–
	M.2 (Except SSD)	1 x 2230 WiFi module	1 x 2242 LTE/5G module; 1 x 2230 Wifi module	–	–
	Mini PCIe	–	1 x full-size Wifi module (BOM option)	–	–
	SIM Socket	–	2	–	–
Storage	2.5" Bay	–	–	1 x 2.5" SSD	1 x 2.5" HDD/SSD (9.5 mm height)
	M.2	2 x 2280 SATA	1 x 2280 SATA	–	–
	mSATA	–	–	1	1
I/O	Console	1	1	1	1
	USB 3.0	–	2	–	–
	USB 2.0	2	–	2	2
	LED Indicator	Power, HDD, WiFi, Software-defined	Power, HDD, 4G/LTE, LTE/WiFi, Software-defined	Power, HDD, Alert, Bypass	Power, HDD
	Display Interface	VGA	–	micro-HDMI	–
	Button	1 x Power	1 x Power	1 x Reset	1 x Power
TPM		TPM2.0 or None TPM	TPM2.0 or None TPM	TPM 1.2 or 2.0 (Optional)	TPM 1.2 support by Infineon SLB9635TT1.2
Power Supply	Power Type	DC (Single/Redundant)	DC	DC 9~36 V	DC
	Watts	120 W	36 W	–	60 W
	Input	100 V ~ 240 V	100 V ~ 240 V	–	100 V ~ 240 V
	Connector	DC Jack	DC Jack	6-pin with P-Fail	DC Jack
	Power Adapter	12V 10A, 120W external adapter	12V 3A, 36W external adapter	–	12V 5A, 60W external adapter
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	-20 ~ 60 °C (-4 ~ 140 °F) 8 Core -20 ~ 70 °C (-4 ~ 158 °F) 2/4 Core	-20 ~ 70 °C (-4 ~ 158 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 85 °C (-40 ~ 185 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Vibration Resistance	SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis	SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis	SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis
	Shock Protection	SATA SSD: 10G, half sine, 11ms duration	SATA SSD: 10G, half sine, 11ms duration	SATA SSD: 10G, half sine, 11ms duration	SATA SSD: 10G, half sine, 11ms duration
	Cooling	2 x system smart fan	Fanless	Fanless	1 x system smart fan
Mechanical	Construction	Steel	Steel	Steel	Steel
	Mounting	Desktop/Rackmount optional	Desktop/Rackmount optional	Din Rail	Desktop
	Dimensions (W x H x D)	339 x 44 x 241 mm (13.35" x 1.73" x 9.49")	220 x 44 x 160 mm (8.66" x 1.73" x 6.3")	88 x 150 x 127 mm (3.46" x 5.9" x 5")	280 x 44 x 176 mm (11.02" x 1.73" x 6.93")
	Weight	3.0 kg (6.6 lbs)	2.3 kg (5.1 lbs)	3.0 kg (6.6 lbs)	2.0 kg (4.4 lbs)
OS Support		Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages		QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; Sierra QMI drivers; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: DUI (Offline Diagnostics)	QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; Sierra QMI drivers; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: DUI (Offline Diagnostics)	QuickStart Linux Image (Ubuntu based reference BSP): afru; Advanced LAN Bypass Utility; Intel DPDK	QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; Advanced LBP Utility; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)
IPMI		Supported by SKU	-	–	–
Certification		CE, FCC, CCC, CB, UL	CE, FCC Class B, CCC, CB, UL	CE, FCC Class A, CCC, CB, UL	CE, FCC Class A, CCC, CB, UL

Network Appliances

Model		☞ FWA-2011	☞ FWA-2012	☞ FWA-2112	☞ FWA-2320
Form Factor		1U Rackmount	1U Rackmount	1U Rackmount	1U Rackmount
Processor System	Processor	Intel® Atom™ E3940/3930, Intel® Celeron® J3355/3455	Intel® Atom™ C3558/C3758/C3958	Intel® Atom™ C3558/C3758	Intel® Atom™ C2358/2558/C2758
	Core Count	2C/4C	4C/8C/16C	4C/8C	2C/4C/8C
	Frequency	1.6GHz/2.0GHz	2.2GHz/2.2GHz/2.0GHz	2.2GHz/2.2GHz	1.7GHz/2.4GHz/2.4GHz
	L2 Cache	2MB	≤8C 2MB/Core; >8C 2MB/Core Pair	2MB/Core	1MB/2MB/4MB
	BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Virtualization		VT-x, VT-d	VT-x, VT-d	VT-x, VT-d	VT-x
Memory	Technology	DDR3L 1866MHz	DDR4 2400MHz	DDR4 2400MHz	DDR3/DDR3L 1600MHz
	Max. Capacity	8GB	64GB	64GB	16GB
	Socket	2 x 204-pin SO-DIMM	2 x 288-pin DIMM	2 x 260-pin SO-DIMM	2 x 240-pin DIMM
	ECC Support	–	Yes	Yes	Yes
Networking	Controller	6 x Intel i210-AT	1 x Marvell 88E1543 2 x Intel i210	6 x 1GbE RJ45; 2 x 1GbE SFP (Optional)	4 x Marvell 88E1111 2 x Intel i210
	1GbE	6 x 1GbE RJ45 via Intel i210-AT	4 x 1GbE RJ45 via Marvell 1543 (2 pairs LAN bypass) 2 x GbE RJ45 via Intel i210	6 x 1GbE RJ45; 2 x 1GbE SFP (Optional)	4 x 1GbE RJ45 via Marvell 88E1111 (2 pairs of LAN bypass) 2 x 1GbE RJ45 for management via Intel I210-AT
	10GbE	–	–	2 x 10GbE SFP+ / 4 x 10GbE SFP+ (Optional)	–
LAN bypass	Advanced	2 x segment (4 x ports) (Optional)	2 x segment (4 x ports)	2 x segment (4 x ports)	2 x segment (4 x ports)
	Legacy	2 x segment (4 x ports)	–	–	–
Expansion Slots	PCIe x4	–	1 x Gen3 x4 (≥8C)	–	–
	NMC	1	1	2	–
	Mini PCIe	1 x full-size/half-size slot	1	1	1
Storage	2.5" Bay	1 x 2.5" HDD/SSD (Optional)	1 x 2.5" HDD (Optional)	1 x 2.5" HDD (Optional)	1 x 2.5" HDD/SSD (By request)
	3.5" Bay	1 x 3.5" HDD	1 x 3.5" HDD	1 x 3.5" HDD	1 x 3.5" HDD
	M.2	–	1 x 2280 SATA	–	–
	mSATA	1	–	1	1
	CF	CF (Optional)	–	CF (Optional)	–
I/O	Console	1	1	1	–
	USB 3.0	2	2	–	–
	USB 2.0	–	2 (by pin header)	2	2
	LED Indicator	Power, HDD	Power, Alert, Location	Power, HDD	Power, HDD
	Display Interface	VGA box header	–	–	–
	Button	–	1 x Power	1 x Power	1 x Power
TPM		TPM 1.2 or 2.0 (Optional)	TPM 1.2 or 2.0 (Optional)	–	TPM 1.2 support by Infineon SLB9635TT1.2
LCD Module		16x2 graphic display, 5 buttons	–	–	16x2 graphic display, 5 buttons
Power Supply	Power Type	AC	AC	AC	AC
	Watts	60 W	150 W	250 W/120 W	100 W
	Input	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V
	Connector	AC 3-pin plug	AC 3-pin plug	AC 3-pin plug	AC 3-pin plug
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Vibration Resistance	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis SATA SSD: 0.3 Grms, 5-500Hz, 1hr/axis
	Shock Protection	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration
Cooling		2 x system smart fan	2 x system smart fan	3 x system smart fan	1 x system smart fan
Mechanical	Construction	Steel	Steel	Steel	Steel
	Mounting	1U Rackmount	1U Rackmount	1U Rackmount	1U Rackmount
	Dimensions (W x H x D)	430 x 44 x 300 mm (16.93" x 1.73" x 11.81")	430 x 44 x 320.7 mm (16.93" x 1.73" x 12.63")	438 x 44 x 450 mm (17.24" x 1.73" x 17.72")	426 x 44 x 318 mm (16.77" x 1.73" x 12.52")
	Weight	5.4 kg (11.9 lbs)	6.6 kg (14.6 lbs)	9.5 kg (20.9 lbs)	4.5 kg (9.9 lbs)
OS Support		Linux (CentOS, Red Hat, Ubuntu) Windows* 10	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages		QuickStart Linux Image (Ubuntu based reference BSP): afru; Advanced LAN Bypass Utility; Intel DPDK	QuickStart Linux Image (Ubuntu based reference BSP): afru; ipmitool; lmsensors LCD4Linux; Intel DPDK; Advanced LBP Utility Individual packages: Advanced LBP Library	QuickStart Linux Image (Ubuntu based reference BSP): afru; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT (need add one QAT PCIe card); DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)	QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; LCD4Linux; Advanced LBP Utility; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library
IPMI		–	Option with Advantech LOM Module	–	–
Certification		CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL

Note: "-" = Not Applicable

		☞ FWA-3033	☞ FWA-3050	☞ FWA-3270A/B
Model				
Form Factor		1U Rackmount	1U Rackmount	1U Rackmount
Processor System	Processor	Intel® Xeon E, 8th/9th Gen Core™ i7/i5/i3, Pentium G5400 & Celeron G3900	Intel® Xeon D-2100	Intel E3-1200 v5/v6 & 6th/7th Gen Core™ i7/i5/i3, Pentium® and Celeron®
	Core Count	2C/4C/6C/8C	8C/14C/16C (Optional: 4C/12C)	2C/4C
	Frequency	2.1GHz~3.8GHz	1.9GHz~2.2GHz	2.4GHz~3.6GHz
	L2 Cache	12MB	11MB/22MB	2MB/4MB/8MB
	Chipset	Intel C246	–	Intel C236 & H110
	BIOS	AMI UEFI	AMI UEFI	AMI UEFI
Virtualization		VT-x, VT-d	VT-x, VT-d, EPT	VT-x, VT-d
Memory	Technology	DDR4 2400/2666MHz	DDR4 2133/2400/2666MHz	DDR4 2400MHz
	Max. Capacity	128GB	256GB	64GB
	Socket	4 x 240-pin UDIMM	4 x 288-pin DIMM	4 x 288-pin DIMM
	ECC Support	Intel® Xeon E series support ECC; (I3/I5/I7 do not support ECC)	Yes	Yes
Networking	Controller	6 x i210-AT, 4 x i210-IS	2 x Intel i350, 2 x Intel 210	8 x Intel i210-AT (FWA-3270A) 6 x Intel i210-AT (FWA-3270B)
	1GbE	6 x 1GbE RJ45 via Intel i210 (2 segment advanced bypass) 4 x 1GbE SFP via Intel i210-IS	4 x 1GbE RJ45 via Intel i350-AM4, 4 x 1GbE RJ45 via Intel i350-AM4 (Optional: Advanced LAN bypass) 2 x 1GbE RJ45 via Intel i210-AT for management	8 x 1GbE RJ45 (FWA-3270A) 6 x 1GbE RJ45 (FWA-3270B)
	10GbE	–	4 x 10GbE SFP+ via Intel X722	–
	LAN bypass — Advanced	2 x segment	2 x segment (4 x ports) (Optional)	3 segment (6 x ports), 2 segment (4 x ports) (Optional)
	LAN bypass — Legacy	2 x segment (Optional)	–	3 segment (6 x ports) (FWA-3270A) 2 segment (4 x ports) (FWA-3270B)
Expansion Slots	PCIe x8	–	1 x HH/HL Gen3 x8	1 x FH/HL Gen3 x8
	PCIe x4	1 x FH/HL Gen3 x4, 1 x FH/HL Gen3 x2	-	2 x FH/HL Gen3 x4 (Optional)
	PCIe x1	–	-	TPM 2.0 (FWA-3270A only)
	NMC	2	1	2 (FWA-3270A), 1 (FWA-3270B)
	Mini PCIe	1	–	–
Storage	2.5" Bay	2 x 2.5" HDD/SSD	2 x 2.5" SATA HDD	2 x 2.5" SATA HDD/SSD
	3.5" Bay	1 x 3.5" HDD (Optional)	–	1 x 3.5" SATA HDD
	M.2	1 x (2260/2280) SATA/PCIe Gen3 x2	2 x 2280 SATA/PCIe Gen3 x1/x2	1 x (2242/2260/2280) SATA/PCIe Gen3 x2
	mSATA	–	–	1
	CF	1 x CF slot (SKU option)	–	–
I/O	Console	1	1	1
	USB 3.0	2	2	2
	USB 2.0	2 (By pin header)	–	–
	LED Indicator	Power, HDD	Power, Alert, Location, Software-defined	Power, HDD
	Display Interface	1 x VGA (Rear)	1 x VGA (Rear)	HDMI (FWA-3270A) / DVI (FWA-3270B)
	Button	1 x Power	1 x Power, 1 x Software-defined button	–
	Others	–	–	RS232, 2 x USB option
TPM		Module option	Module option	TPM 2.0 (FWA-3270A only)
LCD Module		16 x 2 graphic display, 5 buttons	16 x 2 graphic display, 5 buttons	16x2 graphic display, 5 buttons
Power Supply	Power Type	(AC) Fixed & redundant option (DC) Redundant option	(AC) Fixed & redundant option (DC) Redundant option	(AC) Fixed & redundant option (DC) Redundant option
	Watts	300 W (1+1) AC/DC (Option: ATX 250 W)	300 W (1+1) AC/DC (Option: ATX 250 W)	250 W / 300 W (1+1) AC/DC
	Input	100 V ~ 240 V / (DC) -48 V	100 V ~ 240 V / (DC) -48 V	100 V ~ 240 V
	Connector	(AC) 3-pin plug / (DC) pin header	(AC) 3-pin plug / (DC) pin header	(AC) 3-pin plug
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Vibration Resistance	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis
	Shock Protection	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration
Cooling		3 x system smart fan	Max. 4 x system smart fan (Hot-swappable optional)	4 x system smart fan
Mechanical	Construction	Steel	Steel	Steel
	Mounting	1U Rackmount	1U Rackmount	1U Rackmount
	Dimension (W x H x D)	438 x 44 x 550 mm (17.24" x 1.73" x 21.65")	438 x 44 x 420 mm (17.24" x 1.73" x 16.54")	430 x 44 x 500 mm (FWA-3232A) 430 x 44 x 375 mm (FWA-3232B)
	Weight	15 kg (33.1 lbs)	15 kg (33.1 lbs)	10 kg/6 kg (22 lbs/13.2 lbs)
OS Support		Linux (CentOS, Red Hat, Fedora, Ubuntu)	Linux (CentOS, Red Hat, Fedora, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages		QuickStart Linux Image (Ubuntu based reference BSP): afru; ipmitool; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)	QuickStart Linux Image (Ubuntu based reference BSP): afru; ipmitool; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)	QuickStart Linux Image (Ubuntu based reference BSP): afru; lmsensors; flashrom; LCD4Linux; Advanced LBP Utility Individual packages: Advanced LBP Library
IPMI		IPMI v2.0 compliant BMC with web interface	IPMI v2.0 compliant BMC with web interface	Option with Advantech LOM Module
Certification		CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL

Network Appliances

Model		☞ FWA-4030	☞ FWA-4130	☞ FWA-5070
Form Factor		2U Rackmount	2U Rackmount	1U Rackmount
Processor System	Processor	Intel E3-1200 v5/v6 & 6th/7th Gen Core™ i7/i5/i3, Pentium® and Celeron®	Intel E3-1200 v5/v6 & 6th/7th Gen Core™ i7/i5/i3, Pentium® and Celeron®	1 x 2nd Gen Intel® Xeon® Scalable
	Core Count	2C/4C	2C/4C	8C~28C
	Frequency	2.4GHz~3.6GHz	2.4GHz~3.6GHz	2.0GHz~3.6GHz
	L2 Cache	2MB~8MB	2MB~8MB	4MB~28MB
	L3 Cache	–	–	up to 38.5MB
	Chipset	100 Series Chipset (C236/H110)	100 Series Chipset (C236)	Intel C626 or C621
	BIOS	AMI UEFI	AMI UEFI	AMI UEFI
Virtualization		–	–	VT-x, VT-d
Memory	Technology	DDR4 2133/2400MHz	DDR4 2133/2400MHz	DDR4 2400/2666MHz
	Max. Capacity	256GB	256GB	768GB
	Socket	4 x 288-pin UDIMM	4 x 288-pin UDIMM	12x 288-pin DIMM
	ECC Support	Yes (E3 CPU only)	Yes (E3 CPU only)	Yes
Networking	Controller	6 x Intel i210-AT	2 x Intel i210-AT	1 x Intel i210-AT
	1GbE	6 x 1GbE RJ45 via Intel I210	2 x 1GbE RJ45 via Intel I210	2 x 1GbE RJ45 via Intel I210
	10GbE	–	–	2 x 10G SFP+ via Intel C626 (by SKU)
LAN bypass	Advanced	2 x pair of LAN Bypass	–	Supported by NMC
	Legacy	Optional	Supported by NMC	Supported by NMC
Expansion Slots	PCIe x16	–	–	1 HH/HL (Internal Card)
	PCIe x4	1 x FH/HL Gen3 x4 (Optional)	2 x FH/HL Gen3 x4 (Optional)	–
	NMC	2/4	4/8	4
Storage	2.5" Bay	Optional	2 x 2.5" HDD/SSD	Max. 3 x 2.5" HDD/SSD
	3.5" Bay	4 x 3.5" HDD	–	–
	M.2	–	–	1 x 2280 SATA (PCIe Gen3 option)
	mSATA	1	1	1
	CF	1	1	1 (Optional)
I/O	Console	1	1	1
	USB 3.0	2	2	2
	USB 2.0	–	–	–
	LED Indicator	Power, HDD	Power, HDD	Power, Alert, Software-defined
	Display Interface	HDMI/DVI	HDMI/DVI	VGA box header
	Button	1 x Power	1 x Power	1 x Power
	Others	RS232, VGA option	RS232, 2 x USB option	–
TPM		TPM1.2 or TPM 2.0 (Optional)	TPM1.2 or TPM 2.0 (Optional)	TPM1.2 or TPM 2.0 (Optional)
LCD Module		16x2 graphic display, 5 buttons	16x2 graphic display, 5 buttons	–
Power Supply	Power Type	(AC) Redundant & non-redundant (DC) Redundant (Optional)	(AC) Redundant (DC) Redundant (Optional)	(AC) Redundant (DC) Redundant (Optional)
	Watts	300 W	300 W	(AC) 650 W / (DC) 800 W
	Input	100 V ~ 240 V	100 V ~ 240 V	(AC) 100 V ~ 240 V, (DC) -72 V ~ -40 V
	Connector	(AC) 3-pin plug / (DC) pin header	(AC) 3-pin plug	(AC) 3-pin plug
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Vibration Resistance	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis
	Shock Protection	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration
Cooling		2/3 x system smart fan	3 x system smart fan	3 x system smart fan
Mechanical	Construction	Steel	Steel	Steel
	Mounting	2U Rackmount	2U Rackmount	1U Rackmount
	Dimension (W x H x D)	438 x 88 x 520 mm (17.24" x 3.46" x 20.47")	438 x 88 x 520 mm (17.24" x 3.46" x 20.47")	438 x 44 x 550 mm (17.24" x 1.73" x 21.65")
	Weight	20 kg (44.1 lbs)	20 kg (44.1 lbs)	20 kg (44.1 lbs)
OS Support		Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages		QuickStart Linux Image (CentOS based reference BSP): afru; lmsensors; flashrom; LCD4Linux; Advanced LBP Utility Individual packages: Advanced LBP Library	QuickStart Linux Image (CentOS based reference BSP): afru; lmsensors; flashrom; LCD4Linux; Advanced LBP Utility Individual packages: Advanced LBP Library	QuickStart Linux Image (CentOS based reference BSP): afru; ipmitool; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)
IPMI		–	Optional	IPMI v2.0 compliant, with web interface and iKVM
Certification		CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL

Model		☞ FWA-6070	☞ FWA-6080	☞ FWA-6170	☞ FWA-6171
Form Factor		2U Rackmount	2U Rackmount	2U Rackmount	2U Rackmount
Processor System	Processor	1 x 2nd Gen Intel® Xeon® Scalable	1 x AMD EPYC™ 7003/7002	2 x 2nd Gen Intel® Xeon® Scalable	2 x 3rd Gen Intel® Xeon® Scalable
	Core Count	8C~28C	16C~64C	8C~28C	8C~38C
	Frequency	2.0GHz~3.6GHz	2.0GHz~3.7GHz	2.0GHz~3.6GHz	2.0GHz~3.6GHz
	L2 Cache	4MB~28MB	-	30MB~75MB	up to 50MB
	L3 Cache	up to 38.5MB	32MB shared by 8 cores	up to 38.5MB	up to 57MB
	Chipset	Intel C626 or C621	-	Intel C626 or C622	Intel C621A or C627A
	BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Virtualization		VT-x, VT-d	AMD-V™	VT-x, VT-d	VT-x, VT-d
Memory	Technology	DDR4 2400/2666MHz	DDR4 3200/2933MHz	DDR4 2666MHz	DDR4 3200MHz
	Max. Capacity	768GB	4TB	1536GB	2048GB
	Socket	12 x 288-pin DIMM	16 x 288-pin DIMM	24 x 288-pin DIMM	32 x 288-pin DIMM
	ECC Support	Yes	Yes	Yes	Yes
Networking	Controller	1 x Intel i210-AT	2 x Intel i210-AT, 1 x Realtek PHY	2 x Intel i210-AT	2 x Intel I210-AT, 1 x Realtek PHY
	1GbE	2 x 1GbE RJ45 via Intel i210	2 x 1GbE RJ45 via Intel i210-AT	2 x 1GbE RJ45 via Intel I210	2 x 1GbE RJ45 via Intel I210
	10GbE	2 x 10G SFP+ via Intel C626 (by SKU)	–	2 x 10G SFP+ via Intel C622/C626	–
	LAN bypass — Advanced	Supported by NMC	Supported by NMC	Supported by NMC	Supported by NMC
	LAN bypass — Legacy	Supported by NMC	–	–	–
Expansion Slots	PCIe x16	–	2 x HH/HL Gen4 x16; 1 x 10.5" Gen4 x16	–	1 x FH/HL Gen4 x16
	PCIe x8	Up to 2 x FH/HL Gen3 x8	–	2 x HH/HL Gen3 x8	1 x FH/HL and 1 x HH/HL Gen4 x8 (Optional)
	NMC	4/8	8	8	8
Storage	2.5" Bay	1 x 2.5" HDD/SSD	2 x hot-swappable 2.5" HDD/SSD 2 x NVMe (Optional)	2 x 2.5" HDD/SSD	2 x hot-swappable 2.5" HDD/SSD
	3.5" Bay	Up to 4 x 3.5" HDD	–	–	–
	M.2	1 x 2280 SATA PCIe Gen3 (Optional)	2 x 2280 SATA	2 x 2280 SATA	2 x 2280 SATA/PCIe Gen4 x2 2 x 2280 SATA/PCIe Gen4 x4
	mSATA	1	–	–	–
	CF	1 (Optional)	1 (By project)	–	–
I/O	Console	1	1	1	1
	USB 3.0	2	2	2	2
	USB 2.0	–	–	–	–
	LED Indicator	Power, Alert, Software-defined	Power, Alert, Location, Software-defined	Power, Alert, Location	Power, Alert, Location, Software-defined
	Display Interface	VGA box header (Reserved)	1 (Rear)	VGA box header (Reserved)	1 (Rear)
	Button	1 x power	1 x power	1 x power	1 x power
TPM		TPM1.2 / TPM 2.0 (Optional)	TPM1.2 / TPM 2.0 (Optional)	TPM1.2	TPM1.2
LCD Module		–	NA / 16x2 graphic display, 5 buttons (Optional)	16x2 graphic display, 5 buttons	16x2 graphic display, 5 buttons
Power Supply	Power Type	(AC) Redundant (Default) (DC) Redundant (Optional)	(AC) Redundant (Default) (DC) Redundant (Optional)	(AC) Redundant (Default) (DC) Redundant (Optional)	(AC) Redundant (Default) (DC) Redundant (Optional)
	Watts	(AC) 650 W / (DC) 800 W	(AC) 800/1300 W / (DC) 1300 W	(AC) 800 W/1200 W	(AC) 850 W/1300 W
	Input	(AC) 100 V ~ 240 V, (DC) -72 V ~ -40 V	(AC) 100 V ~ 240 V, (DC) -72 V ~ -40 V	(AC) 100 V ~ 240 V, (DC) -72 V ~ -40 V	(AC) 100 V ~ 240 V, (DC) -72 V ~ -40 V
	Connector	AC 3-pin plug	AC 3-pin plug	AC 3-pin plug	AC 3-pin plug
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Vibration Resistance	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis	SATA HDD: 0.5 Grms, 5-500Hz, 1hr/axis
	Shock Protection	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration	SATA HDD: 10G, half sine, 11ms duration
Cooling		2 x system smart fan	3 x system smart fan	3 x system smart fan	3 x system smart fan
Mechanical	Construction	Steel	Steel	Steel	Steel
	Mounting	2U Rackmount	2U Rackmount	2U Rackmount	2U Rackmount
	Dimensions (W x H x D)	438 x 88 x 550 mm (17.24" x 3.46" x 21.65")	438 x 88 x 600 mm (17.24" x 3.46" x 23.62")	438 x 88 x 684.5 mm (17.24" x 3.46" x 26.95")	438 x 88 x 684.5 mm (17.24" x 3.46" x 26.95")
	Weight	26.6 kg (58.6 lbs)	15 kg (33.1 lbs)	20 kg (44.1 lbs)	20 kg (44.1 lbs)
OS Support		Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu, Fedora, FreeBSD)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages		QuickStart Linux Image (CentOS based reference BSP): afru; ipmitool; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)	QuickStart Linux Image (CentOS based reference BSP): afru; ipmitool; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)	QuickStart Linux Image (CentOS based reference BSP): afru; ipmitool; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)	QuickStart Linux Image (CentOS based reference BSP): afru; ipmitool; LCD4Linux; Advanced LBP Utility; Intel DPDK; Intel QAT; DUI (Offline Diagnostics) Individual packages: Advanced LBP Library; DUI (Offline Diagnostics)
IPMI		IPMI v2.0 compliant, with web interface and iKVM	IPMI v2.0 compliant, with web interface and iKVM	IPMI v2.0 compliant, with web interface and iKVM	IPMI v2.0 compliant, with web interface and iKVM
Certification		CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL

NMC Series Selection Guide

Model Name	☞ NMC-0108	☞ NMC-0120		☞ NMC-0121	
Ordering Part Number	NMC-0108-04FSA1	NMC-0120-04FBSSA2	NMC-0120-04FBLSA2	NMC-0121-04CSA1	NMC-0121-04CBSA1
Chipset	Intel I350-AM4	Intel I350-AM4	Intel I350-AM4	Intel I350-AM4	Intel I350-AM4
Speed	1 Gb/s	1 Gb/s	1 Gb/s	1 Gb/s	1 Gb/s
Connector Type	4 x Fiber (SFP)	4 x Fiber LC (SR)	4 x Fiber LC (LR)	4 x Copper (RJ45)	4 x Copper (RJ45)
Interfaces	1 x PCIe x4, Gen2	1 x PCIe x4, Gen2	1 x PCIe x4, Gen2	1 x PCIe x4, Gen2	1 x PCIe x4, Gen2
LAN Bypass (Legacy/Advanced)	–	Fiber bypass (OBM Module)	Fiber bypass (OBM Module)	–	Advanced LBP
Present Pin Detection	Yes	Yes	Yes	Yes	Yes
LED Definition	**Speed LED** 10 Mb/s: – 100 Mb/s: – 1000 Mb/s: – **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **Bypass LED (Middle)** LAN Bypass: Amber on Disconnect: Amber blinking Connect: –	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **Bypass LED (Middle)** LAN Bypass: Amber on Disconnect: Amber blinking Connect: –	**Speed LED (Left)** 10 Mb/s: – 100 Mb/s: Amber on (Downgrade speed) 1000 Mb/s: Green on (Maximum speed) **Link/Act/Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED (Left)** 10 Mb/s: – 100 Mb/s: Amber on (Downgrade speed) 1000 Mb/s: Green on (Maximum speed) **Link/Act/Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking
Power — Voltage	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%
Power — Consumption	10 W	10 W	10 W	10 W	10 W
Environment — Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Environment — Storage Temperature	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)
Environment — Storage Humidity	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)
Environment — Vibration Resistance	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
Environment — Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical — Dimensions W x H x D	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm
Mechanical — Weight	0.3 kg	0.7 kg	0.7 kg	0.4 kg	0.4 kg

Note: "-" = Not Applicable

Model Name	☞ NMC-0804	☞ NMC-0805	☞ NMC-0806		☞ NMC-1001
Ordering Part Number	NMC-0804-08FSA1	NMC-0805-08HSA1	NMC-0806-08CSA1	NMC-0806-08CBSA1	NMC-1001-04FSA1
Chipset	Intel I350-AM4	Intel I350-AM4	Intel I350-AM4	Intel I350-AM4	Intel XL710-BM1
Speed	1 Gb/s	1 Gb/s	1 Gb/s	1 Gb/s	1 Gb/s
Connector Type	8 x Fiber (SFP)	4 x Copper (RJ45) + 4 x Fiber (SFP)	8 x Copper (RJ45)	8 x Copper (RJ45)	4 x Fiber (SFP+)
Interfaces	2 x PCIe x4, Gen2	2 x PCIe x4, Gen2	2 x PCIe x4, Gen2	2 x PCIe x4, Gen2	1 x PCIe x8, Gen3
LAN Bypass (Legacy/Advanced)	–	–	–	Advanced LBP	–
Present Pin Detection	Yes	Yes	Yes	Yes	Yes
LED Definition	**Speed LED** 10 Mb/s: – 100 Mb/s: – 1000 Mb/s: – **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED (Left)** 10 Mb/s: – 100 Mb/s: Amber on (Downgrade speed) 1000 Mb/s: Green on (Maximum speed) *Note: No LED for SFP Connector **Link/Act/Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED (Left)** 10 Mb/s: – 100 Mb/s: Amber on (Downgrade speed) 1000 Mb/s: Green on (Maximum speed) **Link/Act/Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED (Left)** 10 Mb/s: – 100 Mb/s: Amber on (Downgrade speed) 1000 Mb/s: Green on (Maximum speed) **Link/Act/Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking	**Speed LED** 1 Gb/s: – 10 Gb/s: – **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –
Power Voltage	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%
Power Consumption	15 W	15 W	15 W	15 W	15 W
Environment Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Storage Temperature	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)
Storage Humidity	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)
Vibration Resistance	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical Dimensions W x H x D	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm
Weight	0.5 kg	0.5 kg	0.7 kg	0.7 kg	0.5 kg

NMC Series Selection Guide

Model Name	☞ NMC-1001	☞ NMC-1004	☞ NMC-1009	☞ NMC-1010
Ordering Part Number	NMC-1001-04FSA1	NMC-1004-02FSA1	NMC-1009-02FSA1	NMC-1010-02FBSSA1
Chipset	Intel XL710-BM1	Intel 82599ES	Intel XL710-BM1	Intel X710-BM2
Speed	10 Gb/s	10 Gb/s	10 Gb/s	10 Gb/s
Connector Type	4 x Fiber (SFP+)	2 x Fiber (SFP+)	2 x Fiber (SFP+)	2 x Fiber LC (SR)
Interfaces	1 x PCIe x8, Gen3	1 x PCIe x8, Gen2	1 x PCIe x8, Gen3	1 x PCIe x8, Gen3
LAN Bypass (Legacy/Advanced)	–	–	–	Fiber bypass (OBM Module)
Present Pin Detection	Yes	Yes	Yes	Yes
LED Definition	**Speed LED** 1 Gb/s: – 10 Gp/s: – **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED** 1 Gb/s: Amber on (Downgrade speed) 10 Gb/s: Green on (Maximum speed) **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED** 1 Gb/s: – 10 Gb/s: – **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **Bypass LED (Middle)** LAN Bypass: Amber on Disconnect: Amber blinking Connect: –
Power — Voltage	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%
Power — Consumption	15 W	15 W	15 W	15 W
Environment — Operating Temperature	-5 ~ 45 °C (23 ~ 113 °F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Environment — Storage Temperature	-20 ~ 65 °C (-4 ~ 149 °F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)
Environment — Storage Humidity	5 ~ 85% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)
Environment — Vibration Resistance	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
Environment — Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical — Dimensions W x H x D	74.6 x 42.4 x 174.7mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm
Mechanical — Weight	0.5 kg	0.4 kg	0.5 kg	0.7 kg

Note: "-" = Not Applicable

Network
Appliances 1

Servers,
Server Boards
and Chassis 2

Network
Interface &
Acceleration
Cards 3

GPU
Solutions 4

Video
Infrastructure
Solutions 5

Model Name	☞ NMC-1011	☞ NMC-1012	☞ NMC-2501	☞ NMC-2503
Ordering Part Number	NMC-1011-08FSA1	NMC-1012FN-08A1	NMC-2501-02FSA1	NMC-2503FN-04A1
Chipset	Intel XL710-BM1	Intel E810-CAM2	Intel XXV710-DA2	Intel E810-CAM1
Speed	10 Gb/s	10 Gb/s	25 Gb/s	25 Gb/s
Connector Type	8 x Fiber (SFP+)	8 x Fiber (SFP+)	2 x Fiber (SFP28)	4 x Fiber (SFP28)
Interfaces	1 x PCIe x8, Gen3	1 x PCIe x8, Gen4	1 x PCIe x8, Gen3	1 x PCIe x8, Gen4
LAN Bypass (Legacy/Advanced)	–	–	–	–
Present Pin Detection	Yes	Yes	Yes	Yes
LED Definition	**Speed LED (Left)** 1 Gb/s: Amber on (Downgrade speed) 10 Gb/s: Green on (Maximum speed) **Link/Act/Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED** <10 Gb/s: Amber 10 Gb/s: Green **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED** <25 Gb/s: Amber on (Downgrade speed) 25 Gb/s: Green on (Maximun speed) **Link/Act LED/Bypass LED** Link: Green on Activity: Green Blanking LAN Bypass: – Disconnect: –	**Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –

Power	Voltage	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%
	Consumption	15 W	10 W	16 W	10 W
Environment	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Storage Temperature	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)
	Storage Humidity	95% @ 60 °C (140 °F)	95 % @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)
	Vibration Resistance	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
	Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical	Dimensions W x H x D	74.6 x 42.4 x 174.7mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm
	Weight	0.7 kg	0.5 kg	0.7 kg	0.5 kg

NMC Series Selection Guide

Model Name	☞ NMC-4001	☞ NMC-4005	☞ NMC-4006	☞ NMC-4007	
Ordering Part Number	NMC-4001-04FSA1	NMC-4005-04FSA1	NMC-4006-02FSA1	NMC-4007-04FBSSA2	NMC-4007-04FBLSA2
Chipset	Intel 82599ES	Intel XL710-BM1	Intel X710-BM2	Intel XL710-BM2	Intel XL710-BM2
Speed	10 Gb/s	10 Gb/s	40 Gb/s	10 Gb/s	10 Gb/s
Connector Type	4 x Fiber (SFP+)	4 x Fiber (SFP+)	2 x Fiber (QSFP+)	4 x Fiber LC (SR)	4 x Fiber LC (LR)
Interfaces	1 x PCIe x8, Gen3	1 x PCIe x8, Gen3	1 x PCIe x8, Gen3	1 x PCIe x8, Gen3	1 x PCIe x8, Gen3
LAN Bypass (Legacy/Advanced)	–	–	–	Fiber bypass (OBM Module)	Fiber bypass (OBM Module)
Present Pin Detection	Yes	Yes	Yes	Yes	Yes
LED Definition	**Speed LED** 1 Gb/s: – 10 Gb/s: – **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED** 1 Gb/s: – 10 Gb/s: – **Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Speed LED** <40 Gb/s: – 40 Gb/s: – **Link/Act LED/Bypass LED** Link: Green on Activity: Green Blanking LAN Bypass: – Disconnect: –	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **Bypass LED (Middle)** LAN Bypass: Amber on Disconnect: Amber blinking Connect: –	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **Bypass LED (Middle)** LAN Bypass: Amber on Disconnect: Amber blinking Connect: –
Power — Voltage	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%
Power — Consumption	15 W	15 W	15 W	17 W	17 W
Environment — Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Environment — Storage Temperature	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)
Environment — Storage Humidity	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)
Environment — Vibration Resistance	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
Environment — Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical — Dimensions W x H x D	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm
Mechanical — Weight	0.4 kg	0.5 kg	0.6 kg	0.7 kg	0.7 kg

Note: "-" = Not Applicable

		☞ NMC-4008	☞ NMC-4009	☞ NMC-6002
Model Name				
Ordering Part Number		NMC-4008-02FBSLA1	NMC-4009-04CSA1	NMC-6002-02FSA1
Chipset		Intel XL710-BM2	Intel X550	Mellanox ConnectX-5
Speed		40 Gb/s	10 Gb/s	100 Gb/s
Connector Type		2 x Fiber (QSFP+)	4 x Cooper (RJ45)	2 x Fiber (QSFP28)
Interfaces		1 x PCIe x8, Gen3	2 x PCIe x4, Gen3	2 x PCIe x8, Gen3
LAN Bypass (Legacy/Advanced)		Advanced LBP	–	–
Present Pin Detection		Yes	Yes	Yes
LED Definition		**Speed LED** <40 Gb/s: – 40 Gb/s: – **Link/Act/Bypass LED** Link: Green on Activity: Green Blanking LAN Bypass: Amber on Disconnect: Amber blinking	**Speed LED** 1 Gb/s: Amber on (Downgrade speed) 10 Gb/s: Green on (Maximum speed) **Link/Act LED/Bypass LED** Link: Green on Activity: Green Blanking LAN Bypass: – Disconnect: –	**Speed LED** <100 Gb/s: – 100 Gb/s: – **Link/Act/Bypass LED** Link: Green on Activity: Green Blanking LAN Bypass: – Disconnect: –
Power	Voltage	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%
	Consumption	15 W	30 W	35 W
Environment	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Storage Temperature	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)	-40°C ~ 70°C (-40°F ~ 158°F)
	Storage Humidity	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)
	Vibration Resistance	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
	Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical	Dimensions W x H x D	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	149.6 x 42.4 x 174.7 mm
	Weight	0.5 kg	0.6 kg	0.5 kg

NMC Series Selection Guide

Model Name	☞ NMC-6003	☞ NMC-6003L		☞ NMC-E02
Ordering Part Number	NMC-6003-02FSA1	NMC-6003L-01FSA1	NMC-6003L-02FSA1	NMC-E02-04CSA1
Chipset	Intel E810-CAM2	Intel E810-CAM2	Intel E810-CAM2	Intel I350-AM4
Speed	100 Gb/s	100 Gb/s	100 Gb/s	1 Gb/s
Connector Type	2 x Fiber (QSFP28)	1 x Fiber (QSFP28)	2 x Fiber (QSFP28)	4 x Copper (RJ45) with PoE
Interfaces	2 x PCIe x8, Gen3	1 x PCIe x8, Gen4	1 x PCIe x8, Gen4	1 x PCIe x8, Gen3
LAN Bypass (Legacy/Advanced)	–	–	–	–
Present Pin Detection	Yes	Yes	Yes	Yes
LED Definition	**Speed LED** <100 Gb/s: Amber on (Downgrade speed) 100 Gb/s: Green on (Maximum) **Link/Act/Bypass LED** Link: Green on Activity: Green Blanking LAN Bypass: – Disconnect: –	**Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**Link/Act/Bypass LED** Link: Green on Active: Green Blinking LAN Bypass: – Disconnect: –	**1. LAN (Right LED)** a. 100 Mb/s Link: Yellow on b. 100 Mb/s Active: Green brink c. 1000 Mb/s Link: Green on d. 1000 Mb/s Active: Green brink **2. PoE (Left LED)** a. PoE Off: LED off b. PoE On: LED on c. PoE Fail: LED blink
Power	Voltage	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%	+12 V ± 10%
	Consumption	35 W	10 W	10 W	10 W
Environment	Operating Temperature	0°C ~ 40°C (32°F~104°F)	0°C ~ 40°C (32°F~104°F)	0°C ~ 40°C (32°F~104°F)	0°C ~ 40°C (32°F~104°F)
	Storage Temperature	-40°C ~ 70°C (-40°F~158°F)	-40°C ~ 70°C (-40°F~158°F)	-40°C ~ 70°C (-40°F~158°F)	-40°C ~ 70°C (-40°F~158°F)
	Storage Humidity	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)	95% @ 60 °C (140 °F)
	Vibration Resistance	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G/Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
	Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical	Dimensions W x H x D	149.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm	74.6 x 42.4 x 174.7 mm
	Weight	0.5 kg	0.5 kg	0.5 kg	0.5 kg

Note: "-" = Not Applicable

NMC and Transceiver Compatibility List

1GbE Transceiver List

Connector Type		SFP 1G SR	SFP 1G LR
Part Number		NMC-TEL001S-00A1	NMC-TEL001L-00A1
Model	☞ NMC-0108	Yes	Yes
	☞ NMC-0804	Yes	Yes
	☞ NMC-0805	Yes	Yes

10GbE Transceiver List

Connector Type		SFP+ 10G SR	SFP+ 10G LR
Part Number		NMC-TEL010S-00A1	NMC-TEL010L-00A1
Model	☞ NMC-1001	Yes	Yes
	☞ NMC-1004	Yes	Yes
	☞ NMC-1009	Yes	Yes
	☞ NMC-1011	Yes	Yes
	☞ NMC-1012	Yes	Yes
	☞ NMC-4001	Yes	Yes
	☞ NMC-4005	Yes	Yes

25GbE Transceiver List

Connector Type		SFP28 25G SR	SFP28 25G LR
Part Number		NMC-TEL025S-00A1	NMC-TEL025L-00A1
Model	☞ NMC-2501	Yes	Yes
	☞ NMC-2503	Yes	Yes

40GbE Transceiver List

Connector Type		QSFP+ 40G SR	QSFP+ 40G LR
Part Number		NMC-TEL040S-00A1	NMC-TEL040L-00A1
Model	☞ NMC-4006	Yes	Yes

100GbE Transceiver List

Connector Type		QSFP28 100G SR	QSFP28 100G LR
Part Number		NMC-TEL100S-00A1	NMC-TEL100L-00A1
Model	☞ NMC-6002	Yes	Yes
	☞ NMC-6003	Yes	Yes
	☞ NMC-6003L	Yes	Yes

2

Servers, Server Boards and Chassis

SKY Servers Overview

Extending the Cloud to the IoT Edge

Advantech SKY Servers are highly configurable platforms designed to maximize compute and storage performance in highly virtualized telecom, industrial, and enterprise hybrid cloud environments.

GPU Servers

Advantech SKY-6000 series are high-density GPU AI training platforms designed to meet the growing trend toward big data and analysis. Powered by dual Intel® Xeon® scalable processors, supporting up to 10 NVIDIA® GPUs. High-density GPU design maximizes the acceleration of highly parallel applications like artificial intelligence (AI), smart cities, medical technology, high performance computing (HPC), and more.

Main Features
- High density GPU card support
- Thermal & acoustic management
- Remote management

Storage Server and Multi-node Servers

Storage server provide extreme computing performance, maximum PCIe configuration and variety of storage options. Multi-node server delivers the highest performance and efficiency in a 2U 4-node design — creating the flexibility to deploy independent workloads on a shared chassis resource that significantly lowers the total cost of ownership.

Main Features
- Highly serviceability and availability
- Maximum computing power and PCIe configuration

Edge Accelerator Servers

Advantech Edge Accelerator Servers are specially designed for Edge AI applications. They offer space efficiency and short-depth design and use high-performance server board technology. They also offer PCIe expansion slots for GPU Cards, NIC, and Accelerator Cards and are suitable for edge AI applications such factory automation, machine vision, security inspection, medical imaging and much more.

Main Features
- Enrich expansion slots (GPU, AI accelerate)
- Space efficiency with short-depth design
- Remote management

Industrial Server Boards

Advantech industrial server boards are based on Intel® Xeon® and Intelligent Platform Management Interface (IPMI) technology, which are ideal for industrial performance-demanding applications such as AOI, vision inspection, video transcoding, and SCADA applications. They accelerate deployment, ease management, and enhance virtualization to facilitate cloud computing.

Main Features
- Industrial-grade design
- Interoperable and optimized I/O
- High network bandwidth

Industrial Server Chassis

Advantech industrial server chassis give equipment developers high performance, efficient, and redundant solutions for industrial environments and critical applications. This product line provides customers with a total solution and value-added services rather than just a regular server product.

Main Features
- High-availability and redundancy
- Industrial-grade design
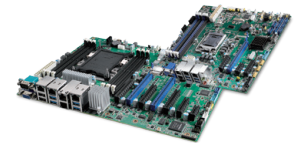- Product life cycle management

Server Boards

Model Name		☞ ASMB-260	☞ ASMB-585	☞ ASMB-785	☞ ASMB-586	☞ ASMB-786	☞ ASMB-587	☞ ASMB-787
Form Factor		Mini-ITX	Micro ATX	ATX	MicroATX	ATX	MicroATX	ATX
Processor System	CPU	Intel® Atom® C3000 Series	Intel® Xeon® E3 v5/v6 and 6th/7th Gen Core™ i3/i5/i7 Series	Intel® Xeon® E3 v5/v6 and 6th/7th Gen Core™ i3/i5/i7 Series	Intel® Xeon® E & 8th/9th Gen Core™ i3/i5/i7 Series	Intel® Xeon® E & 8th/9th Gen Core™ i3/i5/i7 Series	Intel® Xeon® W and 10th Gen Core™ i9/i7/i5/i3 series	Intel® Xeon® W and 10th Gen Core™ i9/i7/i5/i3 series
	Socket	–	1 x socket LGA 1151	1 x socket LGA 1151	1 x socket LGA 1151	1 x socket LGA 1151	1 x socket LGA 1200	1 x socket LGA 1200
	Max. Speed	2.2 GHz	3.9 GHz	3.9 GHz	3.7 GHz	3.7 GHz	3.7 GHz	3.7 GHz
	L3 Cache	2MB (Based on CPU sku)	8MB	8MB	13.5MB	13.5MB	20MB	20MB
	Chipset	-	Intel® C236	Intel® C236	Intel® C246	Intel® C246	Intel® W480E	Intel® W480E
	BIOS	AMI 128 Mbit, SPI	AMI 128Mbit, SPI	AMI 128Mbit, SPI	AMI 256Mbit, SPI	AMI 256Mbit, SPI	AMI 128Mbit, SPI	AMI 256Mbit, SPI
Expansion Slots	PCI	–	–	3	–	–	–	2
	PCIe x16	–	1 (Gen3 x16 link)	1 (switchable to two x8)	1 (Gen3 x16 link)	1 (switchable to two x8)	1 (Gen3 x16 link)	1 (switchable to two x8)
	PCIe x8	–	–	2 (switchable to one x16)	–	2 (switchable to one x16)	–	2 (switchable to one x16)
	PCIe x4	1 (1 Gen3 x4 link)	3 (2 Gen3 x4 link, 1 Gen3 x1 link)	2	2	2	2	2
	PCIe x1	–	–	–	1	3	–	1
	M.2	–	–	–	–	–	1 x M.2 22110/2280 (PCIe/SATA)	1 x M.2 2280/2242 (PCIe/SATA)
Memory	Technology	DDR4 Reg/ unbuffered 2400/ 2133/1866/ 1600 Mhz DIMM	DDR4 ECC/ non-ECC Unbuffer 1600/ 1866/2133/ 2400 MHz	DDR4 ECC/ non-ECC Unbuffer 1600/ 1866/2133/ 2400 MHz	DDR4 ECC/ non-ECC Unbuffer 2133/2400/ 2666 MHz	DDR4 ECC/ non-ECC Unbuffer 2133/2400/ 2666 MHz	DDR4 ECC/ non-ECC Unbuffer 2400/2666 2933 MHz	DDR4 ECC/ non-ECC Unbuffer 2400/2666 2933 MHz
	Max. Capacity	128 GB for RDIMM/ 64 GB for UDIMM	64 GB	64 GB	64 GB	64 GB	128 GB	128 GB
	Socket	4 x 288-pin DIMM	4 x 288-pin DIMM	4 x 288-pin DIMM	4 x 288-pin DIMM	4 x 288-pin DIMM	4 x 288-pin DIMM	4 x 288-pin DIMM
Graphics	Controller	AST2500	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics	Intel® GT2-HD Graphics
	VRAM	DDR3 64MB	1 GB maximum shared memory with 2 GB and above system memory installed	1 GB maximum shared memory with 2 GB and above system memory installed	1 GB maximum shared memory with 2 GB and above system memory installed	1 GB maximum shared memory with 2 GB and above system memory installed	1 GB maxium shared memory with 2GB and above system memory installed	1 GB maxium shared memory with 2GB and above system memory installed
Ethernet	Interface	Gigabit & 10GBase-T Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
	Controller	2 x Intel® I210AT 1 x Intel® X557-AT2	1 x Intel® I219LM 3 x Intel® I210AT (G4 SKU)	1 x Intel® I219LM 3 x Intel® I210AT (G4 SKU)	1 x Intel® I219LM 3 x Intel® I210AT (G4 SKU)	1 x Intel® I219LM 3 x Intel® I210AT (G4 SKU)	1 x Intel® I219LM 3 x Intel® I210AT (G4 SKU)	1 x Intel® I219LM 3 x Intel® I210AT (G4 SKU)
	Connector	RJ-45 x 3 (1 shared with IPMI)	RJ-45 x 4 (G4 SKU)	RJ-45 x 4 (G4 SKU)	RJ-45 x 4 (G4 SKU)	RJ-45 x 4 (G4 SKU)	RJ-45 x 4 (G4 SKU)	RJ-45 x 4 (G4 SKU)
TPM		Optional	Optional	Optional	Optional	Optional	Optional	Optional
SATA	Max. Data Transfer Rate	600MB/s	600 MB/s	600 MB/s	600 MB/s	600 MB/s	600MB/s	600MB/s
	Channels	Up to 8	7	6	8	8	5	5
Rear I/O	VGA/DVI/HDMI/DP	1 / – / – / –	1 / 2 / – / –	1 / 2 / – / –	1 / 1 / 1 / –	1 / 1 / 1 / –	1 / 1 / 1 / –	1 / 1 / 1 / –
	Ethernet	3	4 (G4 SKU)	4 (G4 SKU)	4 (G4 SKU)	4 (G4 SKU)	4 (G4 SKU)	4 (G4 SKU)
	USB	2 x USB 3.2 Gen1	4 x USB 3.2 Gen1	4 x USB 3.2 Gen1	4 x USB 3.2 Gen2	4 x USB 3.2 Gen2	4 x USB 3.2 Gen2	4 x USB 3.2 Gen2
	Audio	–	Mic-in, Line-out	Mic-in, Line-out	Mic-in, Line-out	Mic-in, Line-out	Mic-in, Line-out	Mic-in, Line-out
	Serial	1 (RS-232)	1 (RS-232)	1 (RS-232)	1 (RS-232 via cable)	1 (RS-232 via cable)	1 (RS-232 via cable)	1 (RS-232 via cable)
Onboard I/O	USB	2 x USB 3.2 Gen1	2 x USB 3.2 Gen1 6 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 6 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 6 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 6 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 6 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 6 x USB 2.0 1 x USB 2.0 Type A
	Audio	-	1	1	1	1	1	1
	Serial	1	6	6	1	1	1	1
	Parallel	–	–	1	–	1	–	1
	SATA	8	7	6	8	8	5	5
Watchdog Timer	Output	System reset	System reset	System reset	System reset	System reset	System reset	System reset
	Interval	Programmable, 1~255 sec	Programmable, 1~255 sec/min	Programmable, 1~255 sec/min	Programmable, 1~255 sec/min	Programmable, 1~255 sec/min	Programmable, 1~255 sec/min	Programmable, 1~255 sec/min
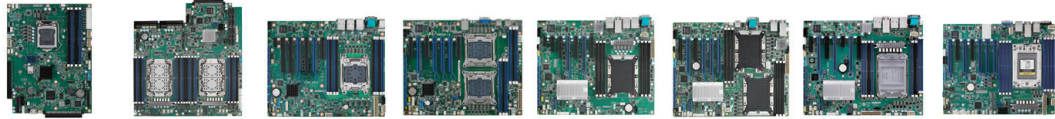
Model Name		☞ ASMB-610	☞ ASMB-622	☞ ASMB-813	☞ ASMB-823	☞ ASMB-815	☞ ASMB-825	☞ ASMB-816	☞ ASMB-830
Form Factor		Proprietary	Proprietary	ATX	ATX	ATX	ATX	ATX	ATX
Processor System	CPU	Intel® Xeon® W & 10th Gen Core™ i9/i7/i5/i3 processors	Intel® Xeon® 3rd Gen Scalable Series	Intel® Xeon® E5-1600 v3/v4 and 2600 v3/v4 Series	Intel® Xeon® E5-2600 v3/v4 Series	Intel® Xeon® Scalable/2nd Gen Scalable Series	Intel® Xeon® Scalable/2nd Gen Scalable Series	Intel® Xeon® 3rd Gen Scalable Series	AMD EPYC™ 7003 Series
	Socket	1 x socket LGA 1200	2 x socket LGA 4189-P+	1 x socket LGA 2011-R3	2 x socket LGA 2011-R3	1 x socket LGA 3647-P0	2 x socket LGA 3647-P0	1 x socket LGA 4189-P+	1 x socket LGA 4094
	Max. Speed	3.5 GHz	3.6 GHz	3.7 GHz	3.5 GHz	3.6 GHz	3.6 GHz	3.6 GHz	3.6 GHz
	Front Side Bus	–	UPI 11.2 GT/s	QPI 9.6GT/s	QPI 9.6GT/s	UPI 10.4 GT/s	UPI 10.4 GT/s	UPI 11.2 GT/s	–
	L3 Cache	20MB	42MB	30MB	30MB	38.5MB	38.5MB	42MB	Max 256MB
	Chipset	W480E	Intel® C621A	Intel® C612	Intel® C612	Intel® C620	Intel® C620	Intel® C621A	N/A
	BIOS	AMI 256 Mbit, SPI	AMI 256 Mbit, SPI	AMI 128 Mbit, SPI	AMI 128 Mbit, SPI	AMI 256 Mbit, SPI	AMI 256 Mbit, SPI	AMI 256 Mbit, SPI	AMI 256 Mbit, SPI
Expansion Slots	PCIe x16	1 (switchable to two x8)	4	2 (switchable to four x8)	4	2 (switchable to four x8)	4	3	5
	PCIe x8	–	4	1	2	1	2	1	2
	PCIe x4	2	–	1	1 (x8 slots with x4 link)	1	–	2	–
	PCIe x1	–	–	1	–	1	–	1	–
	M.2	1 x M.2 2280	1 x M.2 2280	–	–	1 x M.2 2280 (PCIe/SATA)	1 x M.2 2280 (PCIe/SATA)	1 x M.2 2280/22110 (PCIe/ SATA)	2 x M.2 2280/22110 1 x (PCIe/SATA) 1 x (PCIe only)
Memory	Technology	DDR4 ECC/non-ECC Unbuffer 2400/2666/2933 MHz	DDR4 3200/2933/2666 MHz RDIMM, Intel Optane DCPMM	DDR4 REG 2400/2133/1866/1600 MHz DIMM	DDR4 REG 2400/2133/1866/1600 MHz DIMM	DDR4 2933/2666/2400/2133 MHz RDIMM, Intel Optane DCPMM	DDR4 2933/2666/2400/2133 MHz RDIMM, Intel Optane DCPMM	DDR4 2933/2666 MHz RDIMM, Intel Optane DCPMM	DDR4 3200/2933/2666 MHz RDIMM
	Max. Capacity	128 GB	1 TB REG DIMM	256 GB REG DIMM	192 GB REG DIMM	768 GB REG DIMM	768 GB REG DIMM	1 TB REG RDIMM	2TB REG DIMM
	Socket	4 x 288-pin DIMM	16 x 288-pin DIMM	8 x 288-pin DIMM	6 x 288-pin DIMM	6 x 288-pin DIMM	6 x 288-pin DIMM	8 x 288-pin DIMM	8 x 288-pin DIMM
Graphics	Controller	AST 2600	AST2510/AST2500	AST1400/AST2400	AST1400/AST2400	AST2510/AST2500	AST2510/AST2500	AST2510/AST2500	AST2500
	VRAM	DDR4 4Gb	DDR4 4Gb	DDR3 64MB	DDR3 64MB	DDR4 4Gb	DDR4 4Gb	DDR4 4Gb	DDR4 4Gb
Ethernet	Interface	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit & 10GBase-T Ethernet	Gigabit & 10GBase-T Ethernet	Gigabit & 10GBase-T Ethernet	Gigabit & 10GBase-T Ethernet
	Controller	1 x Intel® I350AM4	1 x Intel® I350AM4	2 x Intel® I210AT	2 x Intel® I210AT	2 x Intel® I210AT 1 x Intel® X557-AT2 1 x Realtek 8201EL	2 x Intel® I210AT 1 x Intel® X557-AT2	2 x Intel® I210AT 1 x Intel® X550-AT2 1 x Realtek 8201F	2 x Intel® I210AT 1 x Intel® X550-AT2 1 x Realtek 8201F
	Connector	RJ-45 x 5 (1 dedicated for IPMI)	RJ-45 x 5 (1 dedicated for IPMI)	RJ-45 x 3 (1 dedicated for IPMI)	RJ-45 x 3 (1 shared with IPMI)	RJ-45 x 5 (1 dedicated for IPMI)	RJ-45 x 4 (1 shared with IPMI)	RJ-45 x 5 (1 dedicated for IPMI)	RJ-45 x 5 (1 dedicated for IPMI)
TPM		Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional
SATA	Max. Data Transfer Rate	600 MB/s	600 MB/s	600 MB/s	600 MB/s	600 MB/s	600 MB/s	600 MB/s	600 MB/s
	Channel	3	4	8	9	9	9	8	9
Rear I/O	VGA/DVI/HDMI/DP	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –
	Ethernet	4	4	2	2	4 (T2 SKU)	4 (T2 SKU)	4 (T2 SKU)	4 (T2 SKU)
	USB	2 x USB 3.2 Gen2	2 x USB 3.2 Gen1	4 x USB 3.2 Gen1 2 x USB 2.0	4 x USB 3.2 Gen2	4 x USB 3.2 Gen1 2 x USB 2.0	2 x USB 3.2 Gen1	4 x USB 3.2 Gen1 2 x USB 2.0	2 x USB 3.2 Gen1
	Serial	1 (RS-232)	1 (RS-232)	1 (RS-232)	–	1 (RS-232)	1 (RS-232)	1 (RS-232)	1 (RS-232)
	PS/2	–	–	2	–	–	–	–	–
Onboard I/O	USB	2 x USB 3.2 Gen1 1 x USB 3.2 Gen2 Type A	2 x USB 3.2 Gen1 1 x USB 3.0 Gen1 Type A	2 x USB 3.2 Gen1 2 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 2 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 4 x USB 2.0 1 x USB 2.0 Type A	4 x USB 3.2 Gen1 4 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 4 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 1 x USB 3.2 Gen1 Type A
	Audio	–	–	1	1	1	1	1	–
	Serial	1	1	1	1	1	1	1	1
	SATA	3	4 (in 1 x SFF-8643)	8	9	8	8	8	9
Watchdog Timer	Output	System reset	System reset	System reset	System reset	System reset	System reset	System reset	System reset
	Interval	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min

Server Boards
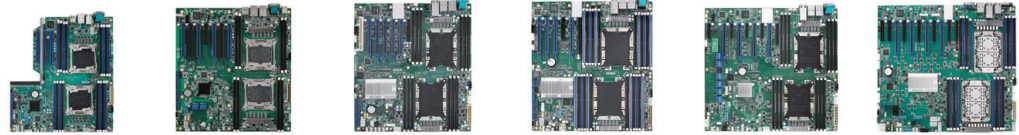
Model Name		☞ ASMB-913	☞ ASMB-923	☞ ASMB-925	☞ ASMB-935	☞ ASMB-975	☞ ASMB-976
Form Factor		EATX	EATX	EATX	EATX	Proprietary	Proprietary
Processor System	CPU	Intel® Xeon® E5-2600 v3/v4 Series	Intel® Xeon® E5-2600 v3/v4 Series	Intel® Xeon® Scalable/2nd Gen Scalable Series	Intel® Xeon® Scalable/2nd Gen Scalable Series	Intel® Xeon® Scalable/2nd Gen Scalable Series	Intel® Xeon® 3rd Gen Scalable Series
	Socket	2 x socket LGA 2011-R3	2 x socket LGA 2011-R3	2 x socket LGA 3647-P0	2 x socket LGA 3647-P0	2 x socket LGA 3647-P0	2 x socket LGA 4189-P+
	Max. Speed	3.5 GHz	3.5 GHz	3.6 GHz	3.6 GHz	3.6 GHz	3.7 GHz
	Front Side Bus	QPI 9.6GT/s	QPI 9.6GT/s	UPI 10.4 GT/s	UPI 10.4 GT/s	UPI 10.4 GT/s	UPI 11.2 GT/s
	L3 Cache	30 MB	30 MB	38.5 MB	38.5 MB	38.5 MB	42MB
	Chipset	Intel® C612	Intel® C612	Intel® C620	Intel® C620	Intel® C620	Intel® C621A
	BIOS	AMI 128 Mbit, SPI	AMI 128 Mbit, SPI	AMI 256 Mbit, SPI	AMI 256 Mbit, SPI	AMI 256 Mbit, SPI	AMI SPI 256 Mbit
Expansion Slots	PCI	–	–	1	–	–	–
	PCIe x 16	4 (1 for PME)	4	5	5	4	4
	PCIe x 8	–	2	1	1	1	7
	PCIe x 4	–	1	–	–	4	–
	M.2	–	–	–	1 x M.2 2280 (PCIe/SATA)	2 x M.2 2242 (SATA)	1 x M.2 2280 (PCIe/SATA) 1 x M.2 2280 (PCIe)
Memory	Technology	DDR4 REG 2400/2133/1866/1600/1333 MHz DIMM	DDR4 REG 2400/2133/1866/1600/1333 MHz DIMM	DDR4 2933/2666/2400/2133 MHz RDIMM, Intel Optane DCPMM	DDR4 2933/2666/2400/2133 MHz RDIMM, Intel Optane DCPMM	DDR4 2933/2666/2400/2133 MHz RDIMM, Intel Optane DCPMM	DDR4 3200/2933/2666 MHz RDIMM, Intel Optane DCPMM
	Max. Capacity	512 GB REG DIMM	256 GB REG DIMM	1.5 TB REG DIMM	3 TB REG DIMM	1.5 TB REG DIMM	2 TB REG DIMM
	Socket	16 x 288-pin DIMM	8 x 288-pin DIMM	12 x 288-pin DIMM	24 x 288-pin DIMM	12 x 288-pin DIMM	16 x 288-pin DIMM
Graphics	Controller	AST1400/AST2400	AST1400/AST2400	AST2510/AST2500	AST2510/AST2500	AST2510/AST2500	AST2510/AST2500
	VRAM	DDR3 64MB	DDR3 64MB	DDR4 4Gb	DDR4 4Gb	DDR4 4Gb	DDR4 4Gb
Ethernet	Interface	Gigabit Ethernet	Gigabit Ethernet	Gigabit & 10GBase-T Ethernet	Gigabit & 10GBase-T Ethernet	Gigabit & 10GBase-T Ethernet	Gigabit & 10GBase-T Ethernet
	Controller	4 x Intel® I210AT	2 x Intel® I210AT	2 x Intel® I210AT 1 x Intel® X557-AT2	2 x Intel® I210AT 1 x Intel® X557-AT2	2 x Intel® I210AT 1 x Intel® X557-AT2	2 x Intel® I210AT 1 x Intel® X550-AT2
	Connector	RJ-45 x 4 (1 shared with IPMI)	RJ-45 x 3 (1 dedicated for IPMI)	RJ-45 x 4 (1 shared with IPMI)	RJ-45 x 4 (1 shared with IPMI)	RJ-45 x 4 (1 shared with IPMI)	RJ-45 x 5 1 x Realtek 8201F (1 dedicated for IPMI)
TPM		Optional	Optional	Optional	Optional	Optional	Optional
SATA	Max. Data Transfer Rate	600 MB/s	600 MB/s	600 MB/s	600 MB/s	600 MB/s	600 MB/s
	Channel	8	10	8	10	14	10
Rear I/O	VGA/DVI/HDMI/DP	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –	1 / – / – / –
	Ethernet	4	2	4 (T2 SKU)	4 (T2 SKU)	4 (T2 SKU)	4 (T2 SKU)
	USB	2 x USB 3.2 Gen1	2 x USB 3.2 Gen1 2 x USB 2.0	4 x USB 3.2 Gen1	4 x USB 3.2 Gen1	4 x USB 3.2 Gen1	2 x USB 3.2 Gen1
	Serial	1 (RS-232)	1 (RS-232)	1 (RS-232)	1 (RS-232)	1 (RS-232)	1 (RS-232)
	PS/2	–	2	–	–	–	–
Onboard I/O	USB	2 x USB 3.2 Gen1 2 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 2 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 4 x USB 2.0 1 x USB 2.0 Type A	2 x USB 3.2 Gen1 2 x USB 2.0 1 x USB 2.0 Type A	4 x USB 3.2 Gen1 2 x USB 2.0 1 x USB 2.0 Type A	4 x USB 3.2 Gen1 2 x USB 3.2 1 x USB 2.0 Type A
	Audio	1	1	1	1	1	1
	Serial	1	1	1	1	1	1
	SATA	8	10	8	10	12	10
Watchdog Timer	Output	System reset	System reset	System reset	System reset	System reset	System reset
	Interval	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min	Programmable, 1 ~ 255 sec/min

Server Chassis

Height (1U = 1.75")		Tower		
Model Name		☞ HPC-2040	☞ HPC-5000	☞ HPC-7000
Form Factor Support		Mini iTX	Micro ATX	Micro ATX, ATX, EATX
No. of slots / No. of full-height cards		1/0	4/2 (11.73" Length)	7/6
Drive Bay	Slim ODD Bay	1	1	1
	5.25" (front-accessible)	–	–	–
	3.5" (hot-swappable)	4 (3.5" / 2.5")	–	–
	3.5" (internal)	–	2 x 3.5" or 1 x 3.5" + 1 x 2.5"	3 (External)
	2.5" (hot-swappable)	–	–	–
	2.5" (internal)	1	–	–
Cooling	Chassis Fan	1 (12cm / 57.2CFM)	1 (12cm / 82CFM)	2 (12cm/150CFM)
	Air Filter	–	Yes	–
Front I/O	USB 3.0	2	2	2
Interface	USB 2.0	–	2	–
Power Supply	Single Power Supply	250W	300W/500W	500W/1200W
	Redundant Power Supply	–	–	–
Miscellaneous	LED Indicators	System: Power, HDD, LAN1, LAN2, System Information	System: Power	System: Power
	Rear Panel	One DB-9 ports openings	Two DB-9 ports openings	Two USB ports openings
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 122 °F)	0 ~ 40 °C (32 ~ 122 °F)	0 ~ 40 °C (32 ~ 122 °F)
	Non-Operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Operating Humidity	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing
	Non-operating Humidity	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing
Physical Characteristics	Dimensions (W x H x D)	210 x 230 x 275 mm (8.3" x 9.1" x 10.8")	192 x 376.7 x 338.5 mm (7.56" x 14.83" x 13.33")	267.1 x 458 x 500 mm (10.52" x 18.03" x 19.69")

Server Chassis

Height (1U = 1.75")		1U			2U		
Model Name		☞ **HPC-6120**	☞ **HPC-7120S**	☞ **HPC-7140**	☞ **HPC-6240**	☞ **HPC-7242**	☞ **HPC-7282**
Form Factor Support		Proprietary	Micro ATX, ATX	Micro ATX, ATX	Proprietary	Micro ATX, ATX	Micro ATX, ATX
No. of slots / No. of full-height cards		4/2	1/1	1/1	8/8	3/3	7/0
Drive Bay	Slim ODD Bay	–	–	1	1 (Ultra Slim)	1	1
	5.25" (front-accessible)	–	–	–	–	–	–
	3.5" (hot-swappable)	–	–	4 (3.5" / 2.5")	–	4 (3.5" / 2.5")	8
	3.5" (internal)	–	–	–	–	–	2
	2.5" (hot-swappable)	2	2 (HPC-7120S-35ZXE only)	–	4	–	Optional
	2.5" (internal)	–	2	–	–	2	–
Cooling	Chassis Fan	3 (4cm/34CFM) 2 (4cm/28CFM)	3 (4 cm/23.1 CFM)	4 (4cm / 23 CFM)	3 (8cm/ 132CFM) 1 (6cm/ 75CFM)	1 (8 cm/47CFM) 2 (6 cm/28CFM)	3 (8cm / 52.6 CFM)
	Air Filter	–	–	–	–	Yes	–
Front I/O	USB 3.0	2	2	-	2	2	–
	USB 2.0	-	-	2	–	–	2
Power Supply	Single Power Supply	500W/650W	350W/850W	350W/500W	1200W	350W/500W	500W/850W
	Redundant Power Supply	650W (Optional)	–	–	1200W	550W	550W/800W
Miscellaneous	LED Indicators	System: Power, Information, LAN1, LAN2, LAN3, LAN4 HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, System Information. HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, System Information. HDD Tray: HDD Power and Activity LED	System: Power, Information, LAN1, LAN2, LAN3, LAN4 HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, temperature, fan. HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, System Information. HDD Tray: HDD Power and Activity LED
	Rear Panel	–	–	–	–	Two DB-9 ports openings	–
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 35 °C (32 ~ 95 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-Operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
	Operating Humidity	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing	10 ~ 85% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing
	Non-operating Humidity	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing
Physical Characteristics	Dimensions (W x H x D)	438 x 44 x 480 mm (17.24" x 1.73" x 18.9")	438 x 43 x 381 mm (17.24" x 1.7" x 15")	437 x 43 x 504mm (17.2" x 1.7" x 19.85")	438 x 88 x 523 mm (17.24" x 3.46" x 20.59")	426.4 x 88 x 525 mm (16.79" x 3.46" x 20.67")	437 x 88.9 x 533.4 mm (17.2" x 3.5" x 21")

			4U		
Height (1U = 1.75")	3U/Tower		4U		
Model Name	☞ HPC-7320	☞ HPC-7420	☞ HPC-7442	☞ HPC-7484	☞ HPC-7485
Form Factor Support	Micro ATX, ATX, EATX	ATX, EATX, EE-ATX	Micro ATX, ATX, EATX	Micro ATX, ATX, EATX	ATX, EATX, EE-ATX
No. of slots / No. of full-height cards	7/6	11/11	7/7	7/7	11/11
Drive Bay — Slim ODD Bay	1	1	1	1	1
Drive Bay — 5.25" (front-accessible)	–	–	–	–	–
Drive Bay — 3.5" (hot-swappable)	2 (3.5" / 2.5")	–	4 can upgrade to 8 (3.5" / 2.5")	8 (3.5" / 2.5")	8 (3.5" / 2.5")
Drive Bay — 3.5" (internal)	2	2	1	–	–
Drive Bay — 2.5" (hot-swappable)	–	2 (Optional)	–	–	–
Drive Bay — 2.5" (internal)	–	2 (Optional)	–	1	2
Cooling — Chassis Fan	2 (8cm/57CFM) 1 (6cm/27.72CFM)	3 (12cm /238 CFM) for HPC-7420-12ZX 3 (8cm /57 CFM) for HPC-7420-85ZX	1 (12cm /114 CFM) 1 (8cm/55 CFM)	2 (12cm /150.33 CFM)	3 (12cm /238 CFM) for HPC-7485-20RX 3 (12cm /232 CFM) for HPC-7485-12RX
Cooling — Air Filter	Yes	Yes	Yes	Yes	–
Front I/O — USB 3.0	2	–	2	2	2
Front I/O — USB 2.0	–	–	–	–	–
Power Supply — Single Power Supply	500W/850W	850W/1200W	500W/700W	700W/1200W	–
Power Supply — Redundant Power Supply	550W/800W	1200W (Optional)	500W	–	1200W/2000W
Miscellaneous — LED Indicators	System: Power, HDD, LAN1, LAN2 HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, System Information HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, temperature, fan. HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, System Information HDD Tray: HDD Power and Activity LED	System: Power, HDD, LAN1, LAN2, System Information HDD Tray: HDD Power and Activity LED
Miscellaneous — Rear Panel	Two DB-9 ports openings	LED panel and two USB openings	Five DB-9 ports and one 68-pin SCSI openings	Five DB-9 ports and one 68-pin SCSI openings	Two DB-9 ports, two PS/2 and two USB openings
Environment — Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 50 °C (32 ~ 122 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
Environment — Non-Operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
Environment — "Operating Humidity"	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing	10 ~ 95% @ 40 °C, non-condensing
Environment — Non-operating Humidity	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing	10 ~ 95% @ 60 °C, non-condensing
Physical Characteristics — Dimensions (W x H x D)	426.4 x 132.2 x 480 mm (16.79" x 5.2" x 18.9")	438 x 177 x 450mm (17.24" x 6.97" x 17.7")	426 x 177 x 600 mm (16.7" x 7.0" x 23.6")	426 x 177 x 630mm (16.7" x 7.0" x 24.8")	435 x 176 x 660mm (17.1" x 6.9" x 25.9")

Server Chassis

Height (1U = 1.75")		1U		2U			3U	4U
Model Name		☞ HPC-8104	☞ HPC-8108	☞ HPC-8208	☞ HPC-8212	☞ HPC-8224	☞ HPC-8316	☞ HPC-8424
Form Factor Support		Micro ATX, ATX	ATX, EATX	ATX, EATX	Micro ATX, ATX, EATX	ATX, EATX	Micro ATX, ATX	ATX, EATX
No. of slots / No. of full-height cards		1/0	1/0	7/0, 3/3	7/0, 3/3 (1 for Raid Card)	7/0, 3/3 (1 for Raid Card)	7/7 (1 for Raid Card)	7/7 (1 for Raid Card)
Drive Bay	Slim ODD Bay	1 (Ultra Slim)	1	1	–	–	–	–
	5.25" (front-accessible)	–	–	–	–	–	–	–
	3.5" (hot-swappable)	4 x SAS3/SATA	–	8 x SAS3/SATA	12 x SAS3/SATA	–	16 x SAS3/SATA	24 x SAS3/SATA
	3.5" (internal)	–	–	–	–	–	–	–
	2.5" (hot-swappable)	–	8 x SAS3 or SATA	–	2 (Rear) only HPC-8212SE-R6A1E	24 x SAS3/SATA	2 (Rear)	2 (Rear)
	2.5" (internal)	2 or 3 (Optional)	–	2	–	–	–	–
	NVMe Support	–	–	–	4 in 12 Hot-Swappable Drive Bays	4 in 24 Hot-Swappable Drive Bays	–	4 in 24 Hot-Swappable Drive Bays
Cooling	Chassis Fan	4 (4cm)	4 (4cm)	3 (8cm)	4 (8cm)	4 (8cm)	4 (8cm)	4 (8cm)
	Air Filter	–	–	–	–	–	–	–
Front I/O Interface	USB 3.0	2	–	2	–	–	2	–
	USB 2.0	–	1	–	2	2	–	2
Power Supply	Single Power Supply	500W	800W	850W	–	–	–	–
	Redundant Power Supply	650W	650W	550W, 800W	550W, 650W, 800W	800W	550W	800W
Miscellaneous	LED Indicators	LAN1, LAN2,HDD, Power and Information LED	LAN1, LAN2,HDD, Power and Information LED	LAN1, LAN2,HDD, Power and Information LED	LAN1, LAN2,HDD, Power and Information LED	LAN1, LAN2,HDD, Power and Information LED	LAN1, LAN2,HDD, Power and Information LED	LAN1, LAN2,HDD, Power and Information LED
	Rear Panel	–	–	–	–	–	–	–
Environment	Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 35 °C (32 ~ 95 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 35 °C (32 ~ 95 °F)	0 ~ 35 °C (32 ~ 95 °F)	0 ~ 35 °C (32 ~ 95 °F)	0 ~ 35 °C (32 ~ 95 °F)
	Non-Operating Temperature	-40 ~ 60 °C (-40 ~ 140 °F)	-40 ~ 60 °C (-40 ~140 °F)	-40 ~ 60 °C (-40 ~ 140 °F)	-40 ~ 60 °C (-40 ~140 °F)	-40 ~ 60 °C (-40 ~140 °F)	-40 ~ 60 °C (-40 ~140 °F)	-40 ~ 60 °C (-40 ~140 °F)
	Operating Humidity	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 35 °C non-condensing	10 ~ 95% @ 40 °C non-condensing	10 ~ 95% @ 35 °C non-condensing	10 ~ 95% @ 35 °C non-condensing	10 ~ 95% @ 35 °C non-condensing	10 ~ 95% @ 35 °C non-condensing
	Non-operating Humidity	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing	10 ~ 95% @ 60 °C non-condensing
Physical Characteristics	Dimensions (W x H x D)	438 x 43.9 x 530mm (17.24" x 1.73" x 20.9")	438 x 43.9 x 597mm (17.24" x 1.73" x 23.5")	438 x 88 x 620mm (17.25" x 3.46" x 24.4")	438 x 88.4 x 540 mm (17.24" x 3.48" x 21.26") 438 x 88.4 x 620 mm (17.24" x 3.48" x 24.41")	438 x 88.4 x 620 mm (17.24" x 3.48" x 24.41")	435 x 132 x 540 mm (17.13" x 5.2" x 21.26")	438 x 176 x 620 mm (17.24" x 6.93" x 24.41")

Edge Accelerator Servers

	1U	2U	4U
Specification	☞ HPC-6120 ☞ ASMB-610	☞ HPC-6240 ☞ ASMB-622	☞ HPC-7420 ☞ ASMB-976
Key Applications	Edge Computing AOI +AI	Edge Computing Traffic Management +AI	Edge Computing Warehouse Management +AI
Features	18" short-depth with 4 FH PCIe expansion slots	20" short-depth with 8 FH PCIe expansion slots	Front Access Design,17" short-depth with 11 FH PCIe expansion slots
	Support double-deck GPU Card with active Fan	Support two double-deck GPU Card with active Fan	Support two double-deck GPU Card with active Fan
	2 x 2.5" Hot-swap SAS/SATA/SSD drive bay	4 x 2.5" Hot-swap SAS/SATA/SSD drive bay	2 x 3.5" SATA drive, 2 x 2.5" SAS/SATA/SSD Hot-swap drive bay in option
	Unify front bezel support	Unify front bezel support	–
Processor Support	Single Intel® Xeon® W & 10th Gen Core™ i9/i7/i5/i3 processors (Comet Lake), TDP up to 95W	Dual Intel® Xeon® Scalable/3rd Gen Scalable Family Processor (Ice Lake) with UPI up to 11.2 GT/s, TDP up to 165W	Dual Intel® Xeon® Scalable/3rd Gen Scalable Family Processor (Ice Lake) with UPI up to 11.2 GT/s, TDP up to 165W
Serverboard	ASMB-610	ASMB-622	ASMB-976
Chipset	Intel® W480E chipset	Intel® C621 chipset	Intel® C621 chipset
System Memory (Max.)	4 DIMM slots, Up to 128GB ECC/non-ECC UDIMM, Up to 2933 MHz	16 DIMM slots, Up to 1TB RDIMM, Up to 3200 MHz, Intel Optane DCPMM support	16 DIMM slots, Up to 2TB RDIMM/LRDIMM, Up to 3200 MHz, Intel Optane DCPMM support
Expansion Slots	▪ 1 FH PCIe Gen3 x 16 or 2 FH PCIe Gen3 x8 (10.5"L) ▪ 2 FH/HL PCIe Gen3 x4	▪ 4 FH PCIe Gen4 x16 (10.5"L) ▪ 3 FH/HL PCIe Gen4 x8 ▪ 1 FH/HL PCIe Gen3 x8 slot with 4 signal	▪ 4 FH/FL PCIe Gen4 x16 ▪ 7 FH/FL PCIe Gen4 x8
Connectivity (Front)	2 x USB3.2 Gen1 LEDs: power, information, LAN1~ LAN4	2 x USB3.2 Gen1 LEDs: power, information, LAN1~ LAN4	▪ 2 x Gigabit Ethernet RJ-45 ▪ 2 x 10GBase-T RJ-45 (in T2 version) ▪ 1 x dedicated IPMI RJ-45 ▪ 2 x USB3.0 ▪ 1 x VGA ▪ 1 x COM ▪ LEDs: HDD, power, information, LAN1, LAN2
Connectivity (Rear)	▪ 4 x Gigabit Ethernet RJ-45 ▪ 1 x dedicated IPMI RJ-45 ▪ 2 x USB3.2 Gen2 ▪ 1 x VGA ▪ 1 x COM	▪ 4 x Gigabit Ethernet RJ-45 ▪ 1 x dedicated IPMI RJ-45 ▪ 2 x USB3.2 Gen1 ▪ 1 x VGA ▪ 1 x COM	–
Management Controller	Aspeed AST2600 BMC	Aspeed AST2500 BMC	Aspeed AST2500 BMC
Management	1 RJ-45 supports IPMI function with dedicated NIC	1 RJ-45 supports IPMI function with dedicated NIC	1 RJ-45 supports IPMI function with dedicated NIC
Peripheral Bays	▪ 4 x hot-swap 2.5" SATA/SAS 6Gb drive bays ▪ 1 x M.2 2280/2242 (PCIe/SATA)	▪ 4 x hot-swap 2.5" SATA/SAS 6Gb drive bays ▪ 2 x hot-swap 2.5" NVMe drive bays in option ▪ 1 x M.2 2280 (PCIe/SATA)	▪ 2 x 3.5" internal SATA drive (1 x internal 3.5" drive bay can change to 2 x 2.5" SAS/SATA 6Gb Hot-swap drive bay in option) ▪ 1 x M.2 2280 (PCIe/SATA) ▪ 1 x M.2 2280 (PCIe)
Power Supply	500W Single Flex ATX PSU 650W 1+0 non-redundancy PSU	1200W 1+1 redundancy PSU 1200W 1+0 non-redundancy PSU	1200W 1+0 non-redundancy PSU
Cooling System	3* 40 x 56 mm system fan 2* 40 x 28 mm system fan	3* 80 x 38 mm system fan 1* 60 x 38 mm system fan	3* 120 x 38 mm system fan
Physical Characteristics (W x H x D)	438 x 44 x 480 mm (17.24" x 1.73" x 18.9")	438 x 88 x 523 mm (17.24" x 3.46" x 20.59")	438 x 177 x 450mm (17.24" x 6.97" x 17.7")
Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 50 °C (32 ~ 122 °F)
Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158°F)	-40 ~ 70 °C (-40 ~ 158°F)	-40 ~ 70 °C (-40 ~ 158°F)
Humidity	10 ~ 95%, non-condensing	10 ~ 95%, non-condensing	10 ~ 95%, non-condensing

Short-depth Servers

Model		☞ SKY-7120S	☞ SKY-7223D	☞ SKY-7632D
Description		1U 5G vRAN & Edge Computing (OTII Compliant) Server	2U 5G vRAN & Edge Computing (OTII Compliant) Server	2U Edge Sever with 3rd Gen Intel® Xeon® Scalable Processors
Form Factor		1U - Rackmount	2U - Rackmount	2U - Rackmount
Processor System	Processor	Intel® Xeon D-2100 Processors	Dual Socket, 2nd Gen Intel® Xeon® Scalable Processors (Cascade Lake)	Dual Socket, 3rd Gen Intel® Xeon® Scalable processors
	Core Number	Up to 16C	Up to 32C	Up to 32C
	Frequency	Up to 2.0GHz	2.2GHz	3.1GHz
	Chipset	N/A	Intel® C626	Intel® C621A
Memory	Technology	4 x DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, Up to 2666MHz	16 x DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, Up to 2933MHz	16 x DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, Up to 3200MHz
	Max. Capacity	512GB	2TB	2TB
	Socket	4 x 288-pin RDIMM/LRDIMM	16 x 288-pin RDIMM/LRDIMM	16 x 288-pin RDIMM/LRDIMM
	ECC Support	ECC/REG	ECC/REG	ECC/REG
Networking	Controller	Intel XL722 / I350	Intel XL722 / XL710	Intel® i210-AT
	1GbE	4 x 10/100/1000Mbps MGMT ports	2 x 10/100/1000Mbps MGMT ports	2 x 10/100/1000Mbps MGMT ports
	10GE	4 x 10Gbps SFP+ ports	6 x 10Gbps SFP+ ports	–
Expansion	PCIe Slots	▪ 2 FH/FL PCIe Gen3 x16 (or 1 FH/FL DW PCIe Gen3 x16)	▪ Up to 4 FH/FL + 2 FH/HL PCIe Gen3 ▪ Up to 2 FH/FL DW + 2 FH/HL PCIe Gen3	▪ 3 LP PCIe Gen4 x16+ 2 LP PCIe Gen4 x8 ▪ 2 x Double Width FH/FL PCIe Gen4 x16)
	M.2 PCIe/SSD	2 x M.2 2280 slots (SATA/PCIe)	2 x M.2 2280 slots (SATA/PCIe)	2 x M.2 2280 slots (NVMe)
Storage	2.5" HDD/SSD	2 x 2.5" hot-swappable SAS/SATA HDD/SSD drives	6 x 2.5" hot-swappable SAS/SATA HDD/SSD drives	6 x 2.5" hot-swappable SAS/SATA HDD/SSD drives
I/O	Console port	1 x RJ45 Console port	1 x RJ45 Console port	1 x RJ45 Console port
	USB2.0/USB3.0	2 x USB3.0/2.0 Type A port	2 x USB3.0/2.0 Type A port	5 x USB3.0/2.0 Type A port
	LED Indicator	1 x Power, 1 x Status, 1 x UID	1 x Power, 1 x Status, 1 x UID	▪ 1 x Power Status, 2 x LAN Activity ▪ 1 x UID, 1 x HDD Status ▪ 1 x System Alarm
	button	1 x Power button, 1 x ID button	1 x Power button, 1 x ID button	1 x Power, 1 x System Reset, 1 x UID
	Others	1 x VGA 1 x GbE Management port	1 x VGA 1 x GbE Management port	1 x VGA 1 x GbE Management port
Power	Power Type	AC / DC redundant	AC / DC redundant	AC, redundant
	Watts	AC 550W, DC 800W	AC 800W / 1200W, DC 800W	AC 800W / 1200W
	Input	100-240V~, 8-4A, 50-60Hz	100-240V~, 8-4A, 50-60Hz	100-240V~, 8-4A, 50-60Hz
Environment	Operating Temperature (air flow 0.7 m/ sec)	-5 ~ 55 °C (23 ~ 131 °F)	-5 ~ 45 °C (23 ~ 113 °F)	-5 ~ 45 °C (23 ~ 113 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
Cooling		4* 40 x 56 mm fan	4* 80 x 38 mm fan	4* 80 x 38 mm fan
Mechanical	Construction	Steel	Steel	Steel
	Mounting	Rack-mounting	Rack-mounting	Rack-mounting
	Dimensions (W x D x H)	438 x 420 x 44 mm (17.2" x 16.5" x 1.73")	448 x 440 x 88 mm (17.6" x 17.3" x 3.46")	438 x 450 x 87 mm (17.2" x 17.7" x 3.42")
	Weight	13 kg	15 kg	15 kg
OS Support		Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu), Windows Server
IPMI		1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node 4. Configurable shared or dedicated NIC support	1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node 4. Configurable shared or dedicated NIC support	1. Aspeed AST2600 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node
Certification		CCC, CB, UL, FCC, CE, RoHS, REACH	CCC, CB, UL, FCC, CE, RoHS, REACH	CB, UL, FCC, CE, VCCI, BSMI RoHS, REACH

	Model	☞ SKY-8101 (20")	☞ SKY-8132S
	Description	Compact 1U High Performance Server Based on Intel® Xeon® Processor Scalable Family	Compact 1U Edge Server based on 3rd Gen Intel® Xeon® Scalable Processor
	Form Factor	1U - Rackmount	1U - Rackmount
Processor System	Processor	Single Intel® Xeon® processor Scalable family	Single socket 3rd Gen Intel® Xeon® Scalable Processor
	Core Number	Up to 28C	Up to 28C
	Frequency	Up to 2.9GHz	Up to 3.6GHz
	Chipset	Intel® C621/C622/C625/C626	Intel® C62xA series
Memory	Technology	6 x DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM, up to 2933MHz	Up to 8 x 3200MHz DDR4 ECC Standard ECC RDIMM/LRDIMM, up to 3200MHz
	Max. Capacity	384GB/ 64GB per DIMM	512GB/ 64GB per DIMM
	Socket	6 x 288-pin RDIMM/LRDIMM	8 x 288-pin RDIMM/LRDIMM
	ECC Support	ECC/REG	ECC/REG
Networking	Controller	GbE LAN1/2: Intel® i210-AT	GbE LAN 1: Intel® i210-AT
	1GbE	2 x 10/100/1000 Mbps MGMT ports	1 x 10/100/1000 Mbps MGMT ports
	10GE	2 x 1Gbps/10Gbps SFP+ ports	–
Expansion	PCIe Slots	▪ 2 FH/FL PCIe Gen3 x8 (or 1 FH/FL PCIe Gen3 x16) ▪ 1 LP PCIe Gen3 x8 ▪ 1 LP PCIe Gen3 x4 (Compatible with Advantech network adapters)	▪ 2 FH/FL PCIe Gen4 x16 ▪ 2 HH/HL (FH bracket) PCIe Gen4 x16
Storage	M.2 PCIe/SSD	1 x M.2 2280 slot (SATA/PCIe)	2 x M.2 2280 slots (SATA/PCIe)
	2.5" HDD/SSD	4 x 2.5" hot-swappable SAS/SATA HDD/SSD drives	4 x 2.5" hot-swappable SAS/SATA HDD/SSD drives
I/O	Console port	1 x microUSB console	1 x RJ45
	USB2.0/USB3.0	1 x USB3.0/2.0 (Front) 2 x USB3.0/2.0 (Rear)	2 x USB3.0 (Front) 1 x USB3.0 (Rear)
	LED Indicator	ID, Critical, Major, Minor, Power, status LEDs	ID, Critical, Major, Minor, Power, status LEDs
	Reset button	Power button	Reset / Power button
	VGA/Display Port	1 x Display port	1 x VGA port
Power	Power Type	Redundant AC 700W Redundant DC 600W	Redundant AC 700W Redundant DC 600W
	Watts	(AC) 700W (DC) 600W	(AC) 700W (DC) 600W
	Input	(AC) 100-240V_{AC}, 9-4A, 50-60Hz (DC)-44- -65V_{DC}, 18-10A	(AC) 100-240V_{AC}, 9-4A, 50-60Hz (DC)-44- -65V_{DC}, 18-10A
	Power Adapter	AC / DC redundant	AC / DC redundant
Environment	Operating Temperature (air flow 0.7 m/ sec)	-5 ~ 55 °C (23 ~ 131 °F)	-5 ~ 55 °C (23 ~ 131 °F)
	Non-operating Temperature	- 40 ~ 70 °C (-40 ~ 158 °F)	-40 °C (-40 °F) ~ 70 °C (158 °F)
	Cooling	5* 40 x 65mm fan	5* 40 x 65mm fan
Mechanical	Construction	Steel	Steel
	Mounting	Rack-mounting	Rack-mounting
	Dimensions (W x D x H)	438.00 x 506.20 x 44.20 mm (17.24" x 19.93" x 1.74")	438 x 517 x 43.5 mm (17.2 x 20.4" x 1.74")
	Weight	15kg	Approximately 15kg
	OS Support	Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu), Windows Server
	IPMI	1. Aspeed AST2500 BMC with Advantech System Management Solution 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM Support Advantech Web GUI style Node Manager 4. Configurable shared or dedicated NIC support 5. Redfish API support	1. Aspeed AST2500 BMC with Advantech System Management Solution 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM Support Advantech Web GUI style Node Manager 4. Configurable shared or dedicated NIC support 5. Redfish API support
	Certification	CB, UL, FCC, CE, VCCI, RCM, CCC, RoHS, REACH	CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH

Short-depth Servers

Model	☞ SKY-8132S-11	☞ SKY-8201	☞ SKY-8211B (17")
Description	Ultra-short Depth 1U Edge Server based on 3rd Gen Intel Xeon Scalable Processor	Compact 2U High Performance Server Based on Intel® Xeon® Processor Scalable Family	Single Socket 2U High Performance Server based on Intel® Xeon® Processor Scalable Family
Form Factor	1U - Rackmount	2U - Rackmount	2U - Rackmount
Processor System — Processor	Single socket 3rd Gen Intel® Xeon® Scalable Processor	Dual Intel® Xeon® Scalable processors	Single Intel® Xeon® Scalable processor
Core Number	Up to 36C	Up to 28C	Up to 28C
Frequency	Up to 3.5GHz	Up to 2.9GHz	Up to 2.9GHz
Chipset	Intel® C62xA series	Intel® C621/ C622/ C626/ C627/ C628	Intel® C621/ C622
Memory — Technology	Up to 8 x 3200MHz DDR4 RDIMM/ LRDIMM with ECC	16 x DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, up to 2933MHz	6 x DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, up to 2666MHz
Max. Capacity	512GB / 64GB per DIMM	1024GB / 64GB per DIMM	384GB / 64GB per DIMM
Socket	8 x 288-pin RDIMM/LRDIMM	16 x 288-pin RDIMM/LRDIMM	6 x 288-pin RDIMM/LRDIMM
ECC Support	ECC/REG	ECC/REG	ECC/REG
Networking — Controller	GbE LAN: Intel i210-IS support 2 x SFP ports	GbE LAN1: Intel® i210-AT 10GbE SFP+ LAN1/2: Integrated into PCH, with SR-IOV and RDMA support	GbE LAN1/2 (MGMT): Intel® i210-AT
1GbE	Via Add-on PCIe card	2 x 10/100/1000 Mbps MGMT ports	10GbE SFP+: Intel® XL710: 8 x 10Gb
10GE	Via Add-on PCIe card	2 x 1Gbps/10Gbps SFP+ ports	1GbE SFP: Intel® I350 :24 x 1GbE ports
Expansion — PCIe Slots	▪ 2 FH/HL PCIe Gen4 x16 ▪ 1 LP PCIe Gen4 x16	▪ 4 FH/FL PCIe Gen3 x8 ▪ 2 FH/HL PCIe Gen3 x8 (or 4 FH/FL PCIe Gen3 x16) ▪ 2 LP PCIe Gen3 x8	–
Storage — 2.5" HDD/SSD	1 x 2.5" SATA3/NVMe U.2 SSD (depends on SKU)	4 x 2.5" hot-swappable SAS/SATA HDD/SSD drives	–
M.2 PCIe/SSD	2 x M.2 2280 slots (SATA/PCIe)	1 x M.2 2280 slot (SATA/PCIe)	1 x M.2 2280 slot (SATA)
I/O — Console port	1 x RJ45	1 x RJ45	1 x RJ45
USB2.0/USB3.0	2 x USB3.0 ports (Front)	2 x USB3.0/2.0 (Front) 2 x USB3.0/2.0 (Rear)	2 x USB3.0/2.0 (Front)
LED Indicator	alarm LEDs	ID, Critical, Major, Minor, Power, status LEDs	–
Reset button	–	–	Power button
VGA/Display Port	–	1 x VGA port / 1 x Display port	1 x Display port
Power — Power Type	800W D/D power brick	Redundant AC 1200W Redundant DC 800W	Redundant AC 550W Redundant DC 800W
Watts	DC 800W	(AC/DC) 1200/800W	(AC/DC) 550W
Input	(DC) 1+1 redundant DC input feeds (A and B @-38V$_{DC}$ ~ -72V$_{DC}$)	(AC) 100-240V$_{AC}$, 12-10A, 50-60Hz (DC) -36 ~ -72V$_{DC}$, 40-25A	(AC) 100-240V$_{AC}$, 8-4A, 50-60Hz (DC)-48V$_{DC}$, 12A
Power Adapter	NA	AC / DC redundant	AC / DC redundant
Environment — Operating Temperature (air flow 0.7 m/ sec)	-40 °C (-40 °F) ~ 65 °C (149 °F) Depends on CPU model and configuration	-5 °C (23 °F) ~ 55 °C (131 °F)	-20 °C (-4 °F) ~ 70 °C (158 °F)
Non-operating Temperature	-40 °C (-40 °F) ~ 70 °C (158 °F)	-40 °C (-40 °F) ~ 70 °C (158 °F)	-40 °C (-40 °F) ~ 70 °C (158 °F)
Cooling	9* high speed fans	6* 80 x 38mm fan	4* 80 x 38mm fan
Mechanical — Construction	Steel	Steel	Steel
Mounting	Rack-mounting	Rack-mounting	Rack-mounting
Dimensions (W x D x H)	445 x 291 x 43.8mm (17.5" x 11.5" x 1.72")	430 x 508 x 88.6 mm (16.9" x 20" x 3.48")	430 x 430 x 88.1 mm (16.93" x 16.93" x 3.46")
Weight	Approximately 8 kg	18 kg	15 kg
OS Support	Linux (CentOS, Red Hat), Windows Server	Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu)
IPMI	1. Aspeed AST2500 BMC with Advantech System Management Solution 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM Support Advantech Web GUI style Node Manager 4. Configurable shared or dedicated NIC support 5. Redfish API support	1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability 3. iKVM support Advantech WeB GUI style node 4. Redfish API support	1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node 4. Configurable shared or -dedicated NIC support 5. Redfish API support
Certification	CB, UL, FCC, CE, VCCI, CCC, BIS, NOM	CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH, NOM	CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH

Model		☞ SKY-8232D	☞ SKY-8260S
Description		Compact 2U Edge Server based on Dual 3rd Gen Intel® Xeon® Scalable Processors	Compact 2U Carrier Grade, High Performance Server based on AMD EPYC™ 7003/7002 Series Processors
Form Factor		2U - Rackmount	2U - Rackmount
Processor System	Processor	Dual socket 3rd Gen Intel® Xeon® Scalable Processors	Single AMD EPYC™ 7003/7002 Series Processors, 32 cores, 180W
	Core Number	Up to 28C	Up to 32C
	Frequency	Up to 3.6GHz	Up to 3.7GHz
	Chipset	Intel® PCH C62xA series	–
Memory	Technology	Up to 32 x 3200MHz DDR4 ECC Standard ECC RDIMM/LRDIMM	Up to 16 x 3200MHz DDR4 ECC Standard ECC RDIMM/LRDIMM
	Max. Capacity	2048GB / 64GB per DIMM	1024GB / 64GB per DIMM
	Socket	32 x 288-pin RDIMM/LRDIMM	16 x 288-pin RDIMM/LRDIMM
	ECC Support	ECC/REG	ECC/REG
Networking	Controller	GbE LAN 1/2: Intel® i210-AT	GbE LAN 1/2: Intel® i210-AT
	1GbE	2	2
	10GE	NA	NA
Expansion	PCIe Slots	▪ 4 FH/FL PCIe Gen4 x16 + 2 LP PCIe Gen4 x8 ▪ 2 FH/FL PCIe Gen4 x16 + 2 FH/FL PCIe Gen4 x8 + 2 FH/HL PCIe Gen4 x8 + 2 LP PCIe Gen4 x8	▪ 4 FH/FL PCIe Gen4 x16 + 2 LP PCIe Gen4 x8 ▪ 2 FH/FL PCIe Gen4 x16 + 2 FH/FL PCIe Gen4 x8 + 2 FH/HL PCIe Gen4 x8 + 2 LP PCIe Gen4 x8
	M.2 PCIe/SSD	2 x M.2 2280 SATA SSD	2 x 2280 M.2 (SATA3/ PCIe)
Storage	2.5" HDD/SSD	2 x 2.5" SATA SSD (Internal) 2 x 2.5" SATA SSD (Rear)	2 x 2.5" SATA SSD (Internal) 2 x 2.5" SATA /PCIe SSD (Rear)
I/O	Console port	1	1
	USB2.0/USB3.0	2 x USB3.0 (Rear) 1 x USB3.0, 1 x USB2.0 (Front)	2 x USB3.0 (Rear) 1 x USB3.0, 1 x USB2.0 (Front)
	LED Indicator	ID, Critical, Major, Minor, Power, status LEDs	ID, Critical, Major, Minor, Power, status LEDs
	Reset button	Reset button	Reset button
	Others	1 x VGA 2 x GbE LAN RJ45 1 x GbE RJ45 management port 1 x OCP3.0 module slot	1 x VGA 2 x GbE RJ45 1 x GbE RJ45 management port 1 x OCP3.0 module slot
Power	Power Type	1+1 redundant AC / DC PSU with separate power inlets	1+1 redundant AC / DC PSU with separate power inlets
	Watts	1200W AC/ 800W DC PSU	1200W AC/ 800W DC PSU
	Input	AC: 100-240V$_{AC}$, 12-10A, 50-60Hz. DC: -40 - -60V$_{DC}$, 25.2-16.8A	AC: 100-240V$_{AC}$, 12-10A, 50-60Hz. DC: -40 - -60V$_{DC}$, 25.2-16.8A
	Power Adapter	AC / DC redundant	AC / DC redundant
Environment	Operating Temperature (air flow 0.7 m/ sec)	-5°C (23 °F) ~ 55 °C (131 °F)	-5°C (23 °F) ~ 40 °C (104 °F)
	Non-operating Temperature	-40 °C (-40 °F) ~ 70 °C (158 °F)	-40 °C (-40 °F) ~ 70 °C (158 °F)
	Cooling	6* high speed fans (N+1 redundant)	6* high speed fans (N+1 redundant)
Mechanical	Construction	Steel	Steel
	Mounting	Rack-mounting	Rack-mounting
	Dimensions (W x D x H)	436.6 x 533 x 87 mm (17.19" x 20.9" x 3.48")	436 x 533 x 87 mm (17.19" x 20.9" x 3.48")
	Weight	Approximately 18 kg	Approximately 18 kg
IPMI		1. Aspeed AST2500 BMC with Advantech System Management Solution 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. Redfish API support iKVM and Support Advantech Web GUI style Node Manager 4. Configurable shared or dedicated NIC support	1. Aspeed AST2500 BMC with Advantech System Management Solution 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. Redfish API support iKVM and Support Advantech Web GUI style Node Manager 4. Configurable shared or dedicated NIC support
Certification		CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH	CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH

Single-node Servers

Model	☞ SKY-7132D	☞ SKY-7210L	☞ SKY-7221
Description	1U High Performance Rackmount Server	2U Rackmount Hybrid Network Server	2U High Performance Rackmount Server
Form Factor	1U - Rackmount	2U - Rackmount	2U - Rackmount
Processor System — Processor	Dual Socket, 3rd Gen Intel® Xeon® Scalable processors	2nd Gen Intel® Xeon® Scalable Processors (Cascade Lake/Skylake)	2nd Gen Intel® Xeon® Scalable Processors (Cascade Lake/Skylake)
Processor System — Core Number	Up to 32C	Up to 28 C	Up to 28 C
Processor System — Frequency	3.1GHz	Up to 2.4GHz	Up to 2.4GHz
Processor System — Chipset	Intel® C621A	Intel C621	Intel C621
Memory — Technology	DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM, Up to 3200 MHz	DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM, Up to 2933MHz	DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM, Up to 2933MHz
Memory — Max. Capacity	2048GB / 64GB per RDIMM	3TB	3TB
Memory — Socket	32 x 288-pin RDIMM/LRDIMM	24 x 288-pin RDIMM/LRDIMM	24 x 288-pin RDIMM/LRDIMM
Memory — ECC Support	ECC/REG	ECC/REG	ECC/REG
Networking — Controller	Intel® i210-AT	Intel i210	Intel i210
Networking — 1GbE	2 x 10/100/1000Mbps MGMT ports	2 x 10/100/1000 Mbps RJ45 via Intel I210 chip	2 x 10/100/1000 Mbps RJ45 via Intel I210 chip
Networking — 10GE	–	–	–
Expansion — PCIe Slots	Up to 2 FH/HL single-deck PCIe Gen4 x16	3 FH/FL PCIe Gen3 x16 or 6 FH/FL PCIe Gen3 x8	▪ 1 FH/FL PCIe Gen3 x16 ▪ 4 LP PCIe Gen3 x8 ▪ 1 PCIe Gen3 x16 OCP 2.0 NIC or 2 FH/FL PCIe Gen3 x16 ▪ 2 LP PCIe Gen3 x8 ▪ 1 PCIe Gen3 x16 OCP 2.0 NIC
Expansion — M.2 PCIe/SSD	2 x M.2 2280 slots (SATA/PCIe)	1 x M.2 2280	2 x M.2 SATA3
Expansion — mSATA	–	–	–
Storage — 2.5" HDD/SSD	12 x 2.5" SATA/SAS	–	–
Storage — 3.5" HDD	4 x 3.5" SATA/SAS HDD/SSD	12 x 3.5" SATA/SAS HDD/SSD	12 x 3.5" SATA/SAS HDD/SSD
I/O — Console port	–	1	1
I/O — USB2.0/USB3.0	1 x USB3.0, 1 x USB2.0 (Front)	2 x USB3.0 (Rear), 2 x USB2.0 (Front)	4 x USB3.0/2.0
I/O — LED Indicator	1 x Power status, 1 x System status, 1 x HD activity, 1 x Network activity 1 x System UID	6 x System LEDs (Power/HDD/LAN1/LAN2/Info/ID)	1 x Power_LED, 1 x HDD_LED, 1 x Info_LED, 1 x ID_LED
I/O — Reset button	1 x Power, 1 x System Reset, 1 x UID	1 x Reset button 1 x power button 1 x ID button	1 x Power button, 1 x ID button
Power — Power Type	AC, redundant	AC, redundant	AC, redundant
Power — Watts	800W	850W	850 W / 1200W
Power — Input	100-240V~, 8-4A, 50-60Hz	100V ~ 240V, 50-60Hz	100V ~ 240V, 50-60Hz
Power — Power Adapter	–	–	–
Environment — Operating Temperature (air flow 0.7 m/ sec)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
Environment — Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)
Cooling	8* 40 x 38mm fan	6* 60 x 56mm fan	4* 80 x 38mm fan
Mechanical — Construction	Steel	Steel	Steel
Mechanical — Mounting	1U - Rack Mount	2U - Rack Mount	2U - Rack Mount
Mechanical — Dimensions (W x D x H)	438 x 775 x 44.2 mm (17.2" x 30.5" x 1.74")	438 x 730 x 88 mm (17.2" x 28.7" x 3.46")	448 x 760 x 88.4 mm (17.6" x 29.9" x 3.48")
Mechanical — Weight	18 kg	26 kg	25 kg
OS Support	Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
IPMI	1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node 4. Configurable shared or dedicated NIC support CB, UL, FCC, CE, RoHS, REACH	Industry standard BMC, IPMI v2.0 compliant, with web interface, iKVM on request (AMI MegaRAC SP-X)	Industry standard BMC, IPMI v2.0 compliant, with web interface, iKVM on request (AMI MegaRAC SP-X)
Certification	CE, FCC, CB, UL	CE, FCC, CB, UL, CCC	CE, FCC, CB, UL, CC

Model		☞ SKY-7232D	☞ SKY-7260S3P	☞ SKY-8101D (29.5")
Description		2U High Performance Rackmount Server	2U High Performance Rackmount Server	Compact 1U High Performance Server Based on Intel® Xeon® Processor Scalable Family
Form Factor		2U - Rackmount	2U - Rackmount	1U - Rackmount
Processor System	Processor	Dual Socket, 3rd Gen Intel® Xeon® Scalable processors	AMD EPYC™ 7003	Dual Intel® Xeon® Scalable Skylake-SP processors
	Core Number	Up to 32C	Up to 64 C	Up to 28C
	Frequency	Up to 3.1GHz	Up to 3.4GHz	Up to 2.6 GHz
	Chipset	Intel® C621A	AMD EPYC 7003 CPU	Intel® C622/ C625/ C626/ C627
Memory	Technology	DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, Up to 3200 MHz	DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, Up to 3200 MHz	DDR4 DIMMs, ECC/REG/RDIMM/ LRDIMM, Up to 2933 MHz
	Max. Capacity	2048GB / 64GB per RDIMM	1024GB / 64GB per RDIMM	1536 GB / 64 GB per DIMM
	Socket	32 x 288-pin RDIMM/LRDIMM	16 x 288-pin RDIMM/LRDIMM	24 x 288-pin RDIMM/LRDIMM
	ECC Support	ECC/REG	ECC/REG	ECC/REG
Networking	Controller	Intel® i210-AT	Intel® i210-AT	Intel® i210-AT
	1GbE	2 x 10/100/1000Mbps MGMT ports	2 x 10/100/1000Mbps MGMT ports	2 x 10/100/1000 Mbps MGMT ports
	10GE	–	–	2 x 10Gbps SFP+ ports (OCP Mezz. card)
Expansion	PCIe Slots	▪ 2 FH/FL PCIe Gen4 x16 ▪ 2 FH/FL PCIe Gen4 x8 ▪ 2 FH/HL PCIe Gen4 x8 ▪ 2 LP PCIe Gen4 x8 ▪ 2 LP PCIe Gen4 x8 (Optional)	▪ 1 FH/FL PCIe Gen3 x16 ▪ 2 FH/HL PCIe Gen3 x8 ▪ 1 FH/FL PCIe Gen4 x16 ▪ 2 FH/HL PCIe Gen4 x8 ▪ 2 HH/HL PCIe Gen4 x8	▪ 4 FH/¾L PCIe Gen3 x16
	M.2 PCIe/SSD	2 x M.2 2280 slots (SATA/PCIe)	2 x M.2 2280 slots (SATA/PCIe)	2 x M.2 2280 slots (SATA/PCIe)
Storage	2.5" HDD/SSD	24 x 2.5" SATA/SAS	–	4 x 2.5" hot-swappable, SAS/SATA HDD/ SSD drives 4 x 2.5" hot-swappable NVMe SSD (Optional)
	3.5" HDD	12 x 3.5" SATA/SAS HDD/SSD	12 x 3.5" SATA/SAS HDD/SSD	–
	mSATA SSD	–	–	–
I/O	Console port	1 x RJ45	1 x RJ45	1 x RJ45
	USB2.0/USB3.0	1 x USB3.0, 1 USB2.0 (Front) 2 x USB3.0 (Rear)	1 x USB3.0, 1 x USB2.0 (Front) 2 x USB3.0 (Rear)	2 x USB3.0/2.0 Type A port (Front)
	LED Indicator	1 x Power status, 1 x System status, 1 x HD activity, 1 x Network activity 1 x System UID	1 x Power status, 1 x System status, 1 x HD activity, 1 x Network activity 1 x System UID	ID, Power, 3 x SW definable LEDs
	Reset button	1 x Power, 1 x System Reset, 1 x UID	1 x Power, 1 x System Reset, 1 x UID	Power button ID button
	Others	1 x VGA 1 x GbE Management port	1 x VGA 1 x GbE Management port	1 x VGA port 2 x GbE RJ45 2 x 10GbE SFP+
Power	Power Type	AC, redundant	AC, redundant	Redundant AC 800W / 1200W / 1600W
	Watts	AC 800W / 1200W	AC 800W / 1200W	(AC) 800W / 1200W / 1600W
	Input	100-240V~, 8-4A, 50-60Hz	100-240V~, 8-4A, 50-60Hz	100-240V~, 12-6A, 50-60Hz
	Power Adapter	–	–	AC, redundant
Environment	Operating Temperature	0 °C ~ 40 °C (32°F ~ 104 °F)	0 °C ~ 40 °C (32°F ~ 104 °F)	0 °C (32 °F) to 40 °C (104 °F)
	Non-operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-40 °C (-40 °F) to 70 °C (158 °F)
	Cooling	4 x 8038mm fan	4 x 8038mm fan	6* 40 x 56mm fan
Mechanical	Construction	Steel	Steel	Steel
	Mounting	Rack-mounting	Rack-mounting	Rack-mounting
	Dimensions (W x D x H)	438 x 797 x 88 mm (17.2" x 31.3" x 3.46")	438 x 797 x 88 mm (17.2" x 31.3" x 3.46")	438 x 749.7 x 44.2 mm (17.25" x 29.5" x 1.74")
	Weight	25 kg	25 kg	20 kg
OS Support		Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu)
IPMI		1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node	1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node	1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node 4. Configurable shared or -dedicated NIC support
Certification		CB, UL, FCC, CE, RoHS, REACH	CB, UL, FCC, CE, RoHS, REACH	CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH

Single-node Servers

Model		☞ SKY-8101L1 (27.5")	☞ SKY-8201L1 (27.5")
Description		Compact 1U High Capacity Storage Server Based on Intel® Xeon® Processor Scalable Family	Compact 2U High Capacity Storage Server Based on Intel® Xeon® Processor Scalable Family
Form Factor		1U - Rackmount	2U - Rackmount
Processor System	Processor	Single Intel® Xeon® processor Scalable family	Dual Intel® Xeon® Scalable processors
	Core Number	Up to 28C	Up to 28C
	Frequency	2.6GHz	2.6GHz
	Chipset	Intel® C622/ C626/ C627/ C628	Intel® C622/ C626/ C627/ C628
Memory	Technology	6 x DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM, up to 2933MHz	16 x DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM, up to 2933MHz
	Max. Capacity	384GB/ 64GB per DIMM	1024GB/ 64GB per DIMM
	Socket	6 x 288-pin RDIMM/LRDIMM	16 x 288-pin RDIMM/LRDIMM
	ECC Support	ECC/REG	ECC/REG
Networking	Controller	GbE LAN1/2: Intel® i210-AT 10GbE SFP+ LAN1/2: Integrated into PCH, with SR-IOV and RDMA support	GbE LAN1: Intel® i210-AT 10GbE SFP+ LAN1/2: Integrated into PCH, with SR-IOV and RDMA support
	1GbE	2 x 10/100/1000 Mbps MGMT ports	2 x 10/100/1000 Mbps MGMT ports
	10GE	2 x 1Gbps/10Gbps SFP+ ports	2 x 1Gbps/10Gbps SFP+ ports
Expansion	PCIe Slots	▪ 2 FH/FL PCIe Gen3 x8 (or 1 FH/FL PCIe Gen3 x16) ▪ 1 LP PCIe Gen3 x8 ▪ 1 LP PCIe Gen3 x4 (Compatible with Advantech network adapters)	▪ 4 FH/FL PCIe Gen3 x8 + 2 FH/HL PCIe Gen3 x8 (or 4 FH/HL PCIe Gen3 x16) ▪ 2 LP PCIe Gen3 x8
	M.2 PCIe/SSD	1 x M.2 2280 slot (SATA/PCIe)	1 x M.2 2280 slot (SATA/PCIe)
Storage	2.5" HDD/SSD	8 x 2.5" hot-swappable SAS/SATA HDD/SSD drives 2 x 2.5" hot-swappable NVMe SSD	–
	3.5" HDD	–	12 x 3.5" hot-swappable, SAS/SATA HDD/SSD drives 4 x 2.5" hot-swappable NVMe SSD (Optional)
I/O	Console port	1 x microUSB console	1 x RJ45
	USB2.0/USB3.0	1 x USB3.0/2.0 Type A port (Front) 2 x USB3.0/2.0 Type A port (Rear)	2 x USB2.0 Type A port (Front) 2 x USB3.0/2.0 Type A port (Rear)
	LED Indicator	ID, Power, 3 x SW definable LEDs	ID, Power, Status LEDs
	Reset button	Power button ID button	–
	Others	1 x Display port 2 x GbE RJ45 2 x 10GbE SFP+	1 x Display port 1 x VGA port 2 x GbE RJ45 2 x 10GbE SFP+
Power	Power Type	Redundant AC 850W	Redundant AC 1200W
	Watts	(AC) 850W	(AC) 1200W
	Input	(AC) 100-240V$_{AC}$, 12-6A, 50-60Hz	(AC) 100–240V$_{AC}$, 50–60Hz, 12–7A
	Power Adapter	AC, redundant	AC, redundant
Environment	Operating Temperature (air flow 0.7 m/ sec)	0 °C ~ 40 °C (32 °F~104 °F)	0 °C ~ 40 °C (32 °F~104 °F)
	Non-operating Temperature	-40 °C (-40 °F) to 70 °C (158 °F)	-40 °C (-40 °F) to 70 °C (158 °F)
Cooling		6* 40 x 56mm fan	4* 80 x 38mm fan
Mechanical	Construction	Steel	Steel
	Mounting	Rack-mounting	Rack-mounting
	Dimensions (W x D x H)	438.40 x 696.15 x 44.20 mm (17.26" x 27.41" x 1.74") with ear handle	438.4 x 699.8 x 88.1 mm (17.26" x 27.5" x 3.46")
	Weight	16 kg	25 kg
OS Support		Linux (CentOS, Red Hat, Ubuntu), Windows Server	Linux (CentOS, Red Hat, Ubuntu), Windows Server
IPMI		1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node 4. Configurable shared or dedicated NIC support	1. Aspeed AST2500 BMC 2. Advanced Lights Out Management compliant to IPMI2.0 with security and availability enhancements 3. iKVM support Advantech WeB GUI style node 4. Configurable shared or -dedicated NIC support
Certification		CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH	CB, UL, FCC, CE, VCCI, RCM, RoHS, REACH

Multi-node Servers & Storage Servers

Model		☞ SKY-9232D3	☞ SKY-9240
Description		2U4N Multinode HCI Server	2U4N Multinode HCI Server
Form Factor		2U - Rackmount	2U - Rackmount
Processor System	Processor	Single/Dual 3rd Gen Intel® Xeon® Scalable Processors (per node)	Dual 2nd Gen Intel® Xeon® Scalable Processors (per node)
	Core Number	–	Up to 28C
	Frequency	–	–
	Chipset	Intel® C621A	Intel® C620 Series (per node)
Memory	Technology	DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM (per node, 8pcs/CPU) up to 3200MHz	DDR4 DIMMs, ECC/REG/RDIMM/LRDIMM, up to 2666MHz
	Max. Capacity	2TB (per node)	1024GB / 64GB per DIMM (per node)
	Socket	16 x 288-pin RDIMM/LRDIMM	16 x 288-pin RDIMM/LRDIMM
	ECC Support	ECC/REG	ECC/REG
Networking	Controller	–	–
	1GbE	1 x 10/100/1000Mbps BMC/Share NIC ports (per node)	1 x 10/100/1000Mbps BMC/Share NIC ports (per node)
	10GE	–	–
Expansion	PCIe Slots	▪ 1 x HH/HL PCIe Gen4 x16 (per node) ▪ 1 x PCIe Gen3 OCP 2.0 x8 (per node)	▪ 2 HH/HL PCIe Gen3 x 16 (SKU A) ▪ 1 HH/HL PCIe Gen3 x 16 (SKU B) (per node) ▪ 1 PCIe Gen3 OCP x8, supporting KR/SFI x2 (per node)
	M.2 PCIe/SSD	2 x M.2 2280 (NVMe/SATA; per node)	2 x M.2 2280 slots (per node)
Storage	2.5" HDD/SSD	1 x 2.5" NVMe SSD (per node)	1 x 2.5" SAS/SATA/NVMe HDD/SSD drives (per node)
	3.5" HDD	12 x 3.5" SATA HDD drives (3 per node)	12 x 3.5" SATA/SAS HDD drives (3 per node)
I/O	Console port	1 x MicroUSB/node	1 x MicroUSB/node
	USB2.0/USB3.0	1 x USB3.0/USB2.0 Type A port at rear (per node)	2 x USB3.0/USB2.0 Type A port at rear (per node)
	LED Indicator	Power, UID	Power, UID
	Reset button	–	–
	Others	1 x VGA port (per node)	1 x VGA port (per node)
Power	Power Type	Redundant AC 2000W (Redundant power limitation for 100-127V$_{AC}$ is up to 1000W)	Redundant AC 2000W (Redundant power limitation for 100-127V$_{AC}$ is up to 1000W)
	Watts	2000W	2000W
	Input	1000W@100-127V$_{AC}$/12-9.5A, 1800W@200-220V$_{AC}$/10-9.5A, 1980W@220-230V$_{AC}$/10-9.8A, 2000W@230-240V$_{AC}$/10-9.8A	1000W@100-127V$_{AC}$/12-9.5A, 1800W@200-220V$_{AC}$/10-9.5A, 1980W@220-230V$_{AC}$/10-9.8A, 2000W@230-240V$_{AC}$/10-9.8A
	Power Adapter	AC, redundant	AC, redundant
Environment	Operating Temperature (air flow 0.7 m/ sec)	0 ~ 35 °C (32 ~ 95 °F)	0 ~ 35 °C (32 ~ 95 °F)
	Non-operating Temperature	-40 ~ 60 °C (-40 ~ 140 °F)	-40 ~ 60 °C (-40 ~ 140 °F)
Cooling		4* 80 x 76mm hot-swappable PWM fans with fan speed control	4* 80 x 76mm hot-swappable PWM fans with fan speed control
Mechanical	Construction	Steel	Steel
	Mounting	Rack-mounting	Rack-mounting
	Dimensions (W x D x H)	438 x 87.5 x 810 mm	438 x 88 x 774 mm (17.2" x 3.46" x 30.47")
	Weight	50 kg	30 kg (w/o peripherals)
OS Support		–	–
IPMI		Aspeed AST2500 Carrier Grade BMC (IPMI v2.0 compliant) with fail safe updates, Web Interface, KVM, Redfish (Advantech IPMI Core)	Aspeed AST2500 Carrier Grade BMC (IPMI v2.0 compliant) with fail safe updates, Web Interface, KVM, Redfish (Advantech IPMI Core)
Certification		CE/FCC, UL, CB, RoHS, BSMI	CB, UL, FCC, CE, CCC, VCCI, BSMI, RoHS, REACH

WISE-STACK Private Cloud

Model		☞ WISE-STACK200-BH (Standard product)	☞ WISE-STACK200-OH (include OpenStack)
Service	WISE-PaaS Service	WISE-PaaS/EnSaaS K8s Service (BI/Digital twin, AI)	WISE-PaaS/EnSaaS K8s Service (BI/Digital twin, AI)
	IaaS Service	Kubernetes, support RBAC model-based multi-tenancy, HA	OpenStack support full function multi-tenancy, HA
Computing Resources	Processor	vCPU: 120 cores	vCPU: 120 cores
	GPU Card	–	–
	Memory	768GB	768GB
	RAM	32G DDR4 2933 ECC REG x 24	32G DDR4 2933 ECC REG x 24
	Stortage	16TB (Replica 3)	32TB (Replica 3)
	OS disk	Industrial SATA3 240GB SSD x 6	Enterprise SATA3 480GB SSD x 6
	Cache	Industrial SATA3 240GB SSD x 6	Enterprise SATA3 480GB SSD x 6
	3.5" HDD	Enterprise SATA3 4TB 7200rpm HDD x 12	Enterprise SATA3 4TB 7200rpm HDD x 24
	Server Configuration in rack	All in one node x 3	OpenStack HCI node x 3
OS Support in VM	Windows	–	Windows Server
	Linux	–	Linux (CentOS7.6, Ubuntu 18.4, etc.)
Security	Anti-Virus	Optional	Optional
Networking	Networking	10GbE SPF + x 12, 1GbE RJ45 x 6, IPMI (1GbE RJ45) x 3	10GbE SPF + x 12, 1GbE RJ45 x 6, IPMI (1GbE RJ45) x 3
	Network switch	10GbE SPF + x 12, 10GbE RJ45 x 12 (x2)	10GbE SPF + x 12, 10GbE RJ45 x 12 (x2)
Server Selection	Server in rack	SKY-7221 x 3	SKY-7221 x 3 and more
Server Product Photo			

| Model		☞ WISE-STACK200-DS (single node for Digital Twin)	☞ WISE-STACK200-AS (single node for numerical AI)	☞ WISE-STACK200-GS (single node for graphical AI)
Service	WISE-PaaS Service	WISE-PaaS/EnSaaS K8s Service (BI/Digital twin)	WISE-PaaS/EnSaaS K8s Service (BI/Digital twin, AI)	WISE-PaaS/EnSaaS K8s Service (BI/Digital twin, AI)
	IaaS Service	Kubernetes Bare metal	Kubernetes Bare metal	Kubernetes Bare metal
Computing Resources	Processor	Intel Xeon Silver 4216 16Cx1	Intel Xeon Silver 4216 16Cx2	Intel Xeon Silver 4216 16Cx2
	GPU Card	Optional	Optional	Nvidia Quadro RTX A5000 x 2
	Memory	128GB	256GB	256GB
	RAM	32G DDR4 2933 ECC REG x 4	32G DDR4 2933 ECC REG x 8	32G DDR4 2933 ECC REG x 8
	Stortage	8TB (Replica 2)	8TB (Replica 2)	8TB (Replica 2)
	OS disk	Industrial SATA3 240GB SSD x 2	Industrial SATA3 240GB SSD x 2	Industrial SATA3 240GB SSD x 2
	Cache	Industrial SATA3 240GB SSD x 2	Industrial SATA3 240GB SSD x 2	Industrial SATA3 240GB SSD x 2
	3.5" HDD	Enterprise SATA3 4TB 7200rpm HDD x 4	Enterprise SATA3 4TB 7200rpm HDD x 4	Enterprise SATA3 4TB 7200rpm HDD x 4
	Server Configuration in rack	All in one node x 1	All in one node x 1	All in one node x 1
OS Support in VM	Windows	–	–	–
	Linux	–	–	–
Security	Anti-Virus	Optional	Optional	Optional
Networking	Networking	10GbE SPF + x 4, 1GbE RJ45 x 2, IPMI (1GbE RJ45) x 1	10GbE SPF + x 4, 1GbE RJ45 x 2, IPMI (1GbE RJ45) x 1	10GbE SPF + x 4, 1GbE RJ45 x 2, IPMI (1GbE RJ45) x 1
	Network switch	Optional	Optional	Optional
Server Selection	Server in rack	SKY-7221 x 1	SKY-7221 x 1	SKY-7221 x 1
Server Product Photo				

3

Network Interface & Acceleration Cards
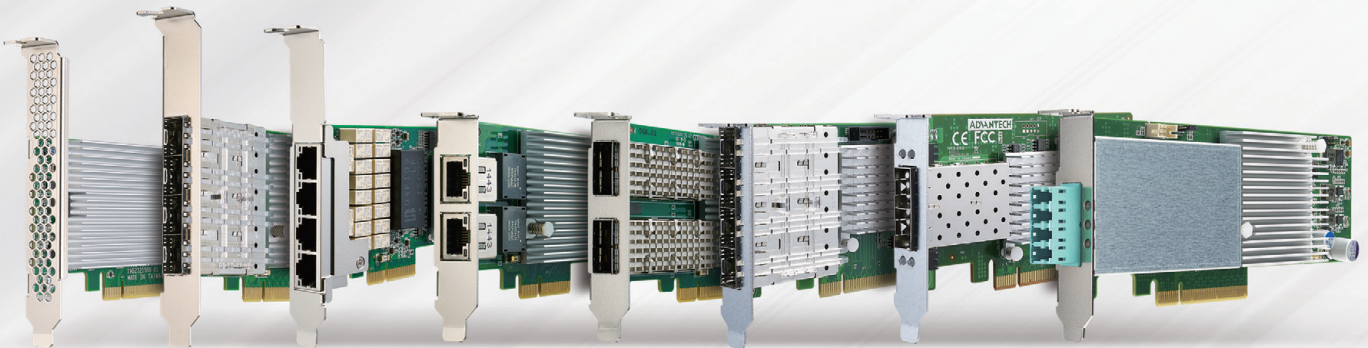
PCI Express Adapters

Advantech's PCI Express adapter range of accelerators and network interface cards enables network equipment and cybersecurity solution providers to integrate LAN access and acceleration devices with more robust and reliable feature sets into industrial PCs, high-performance servers and high-end network appliances. Advantech's family of PCI Express adapters comes in a range of form factors specifically adapted for deployment in high density network appliances and high performance servers.

Leveraging server-class Intel® Ethernet controller technology, Advantech's family of Network Interface Cards gives customers access to a full range of NICs with 10GbE, 25GbE, 40GbE and 100GbE interfaces with industrial life cycle and life cycle management. In addition, our dual or single Intel® QuickAssist Acceleration Cards can supplement the CPU throughput for the termination of standard security protocols such as IPsec and SSL, freeing up valuable cores and CPU cycles for application processing.

Optimized for Virtual Environments

Our PCI Express adapters are designed for multi-core processing applications and optimized for virtualized environments. Support for optimization technologies such VMDq, SR-IOV and DPDK helps reduce I/O bottlenecks and improve overall performance in multi-tenant environments, NFV as well as networking applications such as SD-WAN optimization and cybersecurity.

Multi-core processors and virtualized applications can leverage the I/O technologies available on the network controllers for load balancing data and interrupts amongst themselves. Advantech's PCI Express adapters offer excellent price/performance, enhanced power-savings and are backed by industrial life cycles along with our comprehensive industrial life cycle management program.
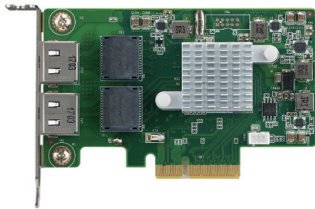
PCIE-1000 Series	PCIE-2000 Series	PCIE-3000 Series
Advantech form factor	Full Range of Network Interface Cards	Security and Compression Offload based on Intel® QuickAssist® Technology

- **Server Class Ethernet**
- **Virtualization Support with SR-IOV and multiple queues**
- **Networking, Storage and Security Offload**
- **Ease of Integration**

- **Full range of products from 1GbE to 100GbE**
- **LAN bypass for fail to wire applications**
- **Fiber options for long reach and noise immunity**
- **Configure to Order Services**

- **Interoperability tested**
- **Revision control**
- **Performance tested with leading Spirent SmartBits**
- **Long Life Cycle**

PCI Express Adapters

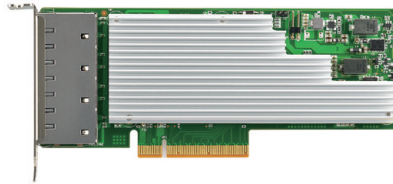| Model Name		☞ PCIE- 1130	☞ PCIE-1131	☞ PCIE-1220	☞ PCIE-1221	☞ PCIE-2130
Description		Quad Port Copper GbE w/ Intel® I350	Quad Port Fiber GbE w/ Intel® I350	Dual Port Fiber 10GbE w/ Intel® X710-BM2	Dual Port Copper 10GbE w/ Intel® X550-AT2	Quad Port Fiber GbE w/ Intel® I350
Chipset		Intel® I350	Intel® I350	Intel® X710-BM2	Intel® X550-AT2	Intel® I350
Network Interfaces	Ports	4 x RJ45	4 x SFP	2x SFP+	2 x RJ45	4 x SFP
	Media	GbE Copper	GbE Fiber	10GbE Fiber	10GBase-T Copper	GbE Fiber
Form type		Advantech form factor	Advantech form factor	Advantech form factor	Advantech form factor	Standard L/P PCIe card
PCIe		PCIe Gen2 x4	PCIe Gen2 x4	PCIe Gen3 x8	PCIe Gen3 x4	PCIe Gen2 x4 (w/PCIe x8 gold finger)
Heatsink		Passive	Passive	Passive	Passive	Passive
Power	Voltage	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%
	Consumption	5 W	5 W	8.5 W	12.5 W	5 W
Environment	Operating Temperature (air flow 0.7 m/sec)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)
	Storage Temperature	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)
	Storage Humidity	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing
Mechanical	Dimensions	110 x 68.9 mm	110 x 68.9 mm	110 x 68.9 mm	110 x 68.9 mm	167 x 68.9 mm
	Net Weight	0.125 kg	0.125 kg	0.125 kg	0.125 kg	0.08 kg
Part Number		PCIE-1130PS-00A1E	PCIE-1131PS-00A1E	PCIE-1220PS-00A1E	PCIE-1221PS-00A1E	PCIE-2130NP-00A1E

Network
Appliances **1**

Servers,
Server Boards
and Chassis **2**

Network
Interface &
Acceleration
Cards **3**

GPU
Solutions **4**

Video
Infrastructure
Solutions **5**

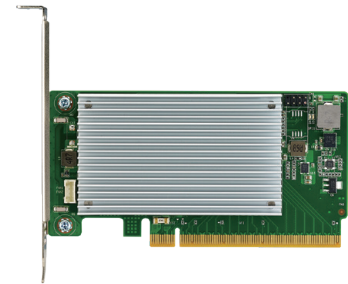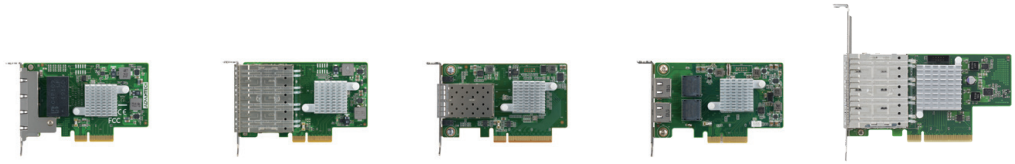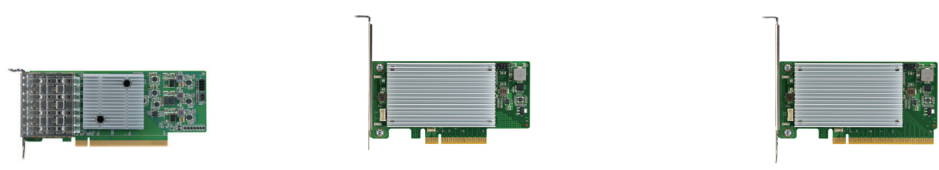| Model Name		☞ **PCIE-2131**	☞ **PCIE-2220**	☞ **PCIE-2221**	☞ **PCIE-2221BP**	☞ **PCIE-2230**
Description		Quad Port Copper LAN Bypass GbE w/ Intel® I350	Dual Port Fiber 10GbE w/ Intel® 82599ES	Dual Port Copper 10GbE w/ Intel® X550-AT2	Dual Port LAN Bypass 10GbE w/ Intel® X710-BM2	Quad Port Fiber 10GbE w/ Intel® XL710-BM1
Chipset		Intel® I350	Intel® 82599ES	Intel® X550-AT2	Intel® X710-BM2	Intel® XL710-BM1
Network Interfaces	Ports	4 x RJ45	2 x SFP+	2 x RJ45	Fiber port	4 x SFP+
	Media	GbE Copper	10GbE Fiber	10GBase-T Copper	10GbE Fiber	10GbE Fiber
Form type		Standard L/P PCIe card	Standard L/P PCIe card	Standard L/P PCIe card	Standard L/P PCIe card	Standard L/P PCIe card
PCIe		PCIe Gen2 x4	PCIe Gen2 x8	PCIe Gen3 x4	PCIe Gen3 x8	PCIe Gen3 x8
Heatsink		Passive	Passive	Passive	Passive	Passive
Power	Voltage	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%
	Consumption	5 W	8.5 W	12.5 W	10 W	9 W
Environment	Operating Temperature (air flow 0.7 m/sec)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 45 °C (32 ~ 113 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)
	Storage Temperature	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)
	Storage Humidity	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing
Mechanical	Dimensions	167 x 68.9 mm	167 x 68.9 mm	167 x 68.9 mm	167 x 68.9 mm	167 x 68.9 mm
	Net Weight	0.125 kg	0.07 kg	0.115 kg	0.2 kg	0.125 kg
Part Number		PCIE-2131BP-00A1E (4 ports w/ bypass) PCIE-2131NP-00A1E (4 ports w/o bypass)	PCIE-2220NP-00A1E	PCIE-2221NP-00A1E (2 ports) PCIE-2221NP-01A1E (1 port)	PCIE-2221BP-00A1E	PCIE-2230NP-00A1E

PCI Express Adapters
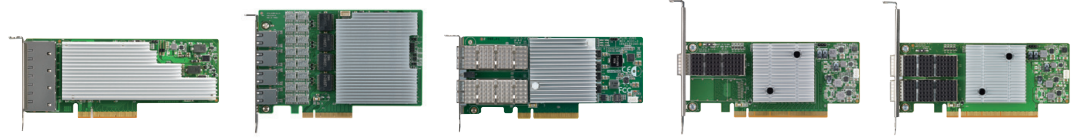
Model Name		☞ PCIE-2231	☞ PCIE-2232BP	☞ PCIE-2320	☞ PCIE-2410	☞ PCIE-2420
Description		Quad Port Copper 10GBase-T w/ Intel® XL710-BM1	Quad Port Copper 10GBase-T LAN Bypass w/ Intel® XL710-BM1 & X557-AT4	Dual Port Fiber 40GbE w/ Intel® XL710-BM2	Single Port Fiber 100GbE w/ Mellanox® ConnectX-5	Dual Port Fiber 100GbE w/ Mellanox® ConnectX-5
Chipset		Intel® XL710-BM1	Intel® XL710-BM1 + X557-AT4	Intel® XL710-BM2	Mellanox® ConnectX-5	Mellanox® ConnectX-5
Network Interfaces	Ports	4 x RJ45	4 x RJ45	2 x QSFP+	1 x QSFP28	2 x QSFP28
	Media	10GBase-T Copper	10GBase-T Copper	40GbE Fiber	100GbE Fiber	100GbE Fiber
Form type		Standard L/P PCIe card	Standard L/P PCIe card	Standard L/P PCIe card	Standard L/P PCIe card	Standard L/P PCIe card
PCIe		PCIe Gen3 x8	PCIe Gen3 x8	PCIe Gen3 x8	PCIe Gen3 x16	PCIe Gen4/ Gen3 x16
Heatsink		Passive	Passive	Passive	Passive	Passive
Power	Voltage	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%	+12 V ± 15%
	Consumption	12.5 W	18 W	9 W	15 W	15 W
Environment	Operating Temperature (air flow 0.7 m/sec)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 45 °C (32 ~ 113 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 45 °C (32 ~ 113 °F)	0 ~ 45 °C (32 ~ 113 °F)
	Storage Temperature	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 65 °C (-40 ~ 149 °F)
	Storage Humidity	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing	0 ~ 90%, non-condensing
Mechanical	Dimensions	167 x 68.9 mm	167.6 x 98.4 mm	167 x 68.9 mm	165 x 66 mm	165 x 66 mm
	Net Weight	0.125 kg	0.125 kg	0.135 kg	0.135 kg	0.135 kg
Part Number		PCIE-2231NP-00A1E	PCIE-2232BP-00A1E	PCIE-2320NP-00A1E	PCIE-2410NP-00B1E (1 port Gen3 x16)	PCIE-2420NP-00B1E (2 port Gen3 x16) PCIE-2420NP-10B1E (2 port Gen4 x16)

| Model Name		☞ PCIE-2531	☞ PCIE-3030		☞ PCIE-3031
Description		Quad Port Fiber 25GbE w/ Intel® E810-CAM1	Intel QuickAssist Server Adapter Card		Intel QuickAssist Server Adapter Card
Chipset		Intel® E810-CAM1	Intel® C625	Intel® C626	Intel® C627
Compression / Encryption Performance		–	20 Gb/s	40 Gb/s	100 Gb/s
Network Interfaces	Ports	4 x SFP28	–		–
	Media	25GbE Fiber	–		–
Form type		Standard L/P PCIe card	Standard L/P PCIe card		Standard L/P PCIe card
PCIe		PCIe Gen4 x16	PCIe Gen3 x8		PCIe Gen3 x16
Heatsink		Passive	Passive		Passive
Power	Voltage	+12 V ± 15%	+12 V ± 15%		+12 V ± 15%
	Consumption	15 W	20 W	20 W	28 W
Environment	Operating Temperature (air flow 0.7 m/sec)	0 ~ 55 °C (32 ~ 131 °F) (55 °C @ 140 LFM)	Tambient= 50 °C & Airflow= 300LFM		Tambient= 50 °C & Airflow= 300LFM
	Storage Temperature	-40 ~ 65 °C (-40 ~ 149 °F)	-40 ~ 70 °C (-40 ~ 158 °F)		-40 ~ 70 °C (-40°F ~ 158 °F)
	Storage Humidity	0 ~ 90%, non-condensing	95% @ 40 °C (140 °F)		95% @ 40 °C (140 °F)
	Vibration Resistance	–	0.5Grms (Operating); 2.16Grms (Non-operating) System condition: Packaged mode Test Frequency: 5-500Hz Test Axis: X, Y and Z axis		0.5Grms (Operating); 2.16Grms (Non-operating) System condition: Packaged mode Test Frequency: 5-500Hz Test Axis: X, Y and Z axis
	Shock Protection	–	4G each axis (Operating); 20G each axis (Non-operating)		4G each axis (Operating); 20G each axis (Non-operating)
Mechanical	Dimensions	164 x 68.9 mm	121.02 x 145.53 mm (w/ bracket)		121.02 x 145.53 mm (w/ bracket)
	Net Weight	0.18 kg	0.35 kg		0.35 kg
Part Number		PCIE-2531NP-00A1E	PCIe-3030NP-00A1E	PCIe-3030NP-01A1E	PCIe-3031NP-00A1E

4

GPU Solutions

GPU Solutions

Transforming AI and High-Performance Computing from the Edge to Cloud

The implementation of AI technology is essential for expanding industrial IoT. Additionally, AI technologies can be tailored to support particular tasks and usage requirements. Leveraging application-specific research and engineering, Advantech has developed a comprehensive AI platform that spans the edge to the cloud and supports inference and training. Our mission is to provide extraordinary AI technologies for a wide range of industrial applications.

Advantech's Industrial GPU Solutions Powered by NVIDIA®

Advantech and NVIDIA® have developed a series of AI offerings to accommodate growing demands for AI deployment. This innovative series demonstrates Advantech's deepening relationship with NVIDIA, a pioneer of accelerated computing and graphics technology that is undergoing a strategic transformation into an AIoT provider. This partnership has been instrumental in bringing AI to manufacturing, transportation, and smart city applications. Advantech and NVIDIA are driving AI innovation by collaborating on the development and worldwide marketing of AI solutions.
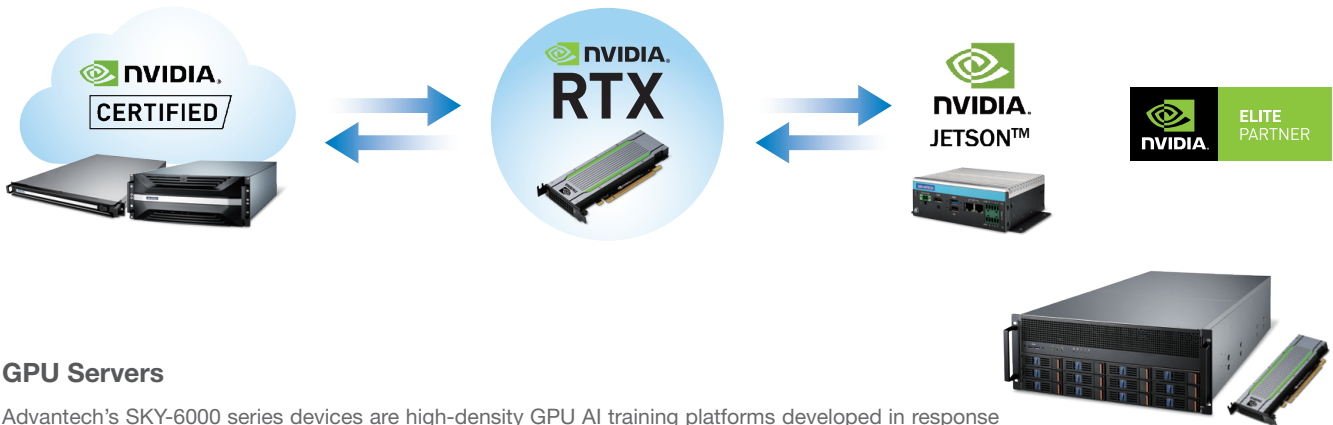
GPU Servers

Advantech's SKY-6000 series devices are high-density GPU AI training platforms developed in response to the trend for big data analytics. Powered by two Intel® Xeon® Scalable processors, each SKY-6000 rackmount industrial server can support up to 10 x NVIDIA® GPUs. This maximizes the acceleration of parallel applications, including AI, deep learning, self-driving cars, smart cities, medical technology, big data, high-performance computing, and virtual reality (VR).

For example, SKY-640V2 integrated with an Intel® Xeon® Scalable processor offers PCIe 4.0 capability for the most advanced GPU cards. With PCIe 4.0, GPU cards can support massive data transformation between GPU cards, networks, and processors, which minimizes latency and maximizes bandwidth for HPC and AI deep learning.

Advantech's SKY-6000 GPU servers equipped with an NVIDIA GPU and NVIDIA Networking have undergone certification testing to validate performance, reliability, and scalability under various workloads. Using Advantech's NVIDIA-certified systems, customers can access the NGC catalog for NVIDIA software.

Video AI Platforms

Advantech's MIC series devices are highly integrated AI inference systems equipped with an NVIDIA® Jetson™ platform. With the provision of high-performance computing, a compact form factor, industrial I/O, and remote management support, MIC series inference systems allow developers to rapidly create unique AI solutions for smart city, automated manufacturing, and medical imaging applications.

NVIDIA GPU Cards

Advantech leverages various NVIDIA-certified GPU cards, including the NVIDIA MXM, Quadro, and Tesla series GPU cards. GPU-accelerated computing involves using a GPU combined with a CPU to accelerate deep learning and data analytics. This optimizes the entire process and can be employed in the fields of industrial computing, manufacturing, medical imaging, transportation, surveillance, telecommunications, gaming, and robotics.

GPU Servers

	☞ **SKY-6100**	☞ **SKY-6200**
Key Applications	• Cloud computing • IoT edge computing • Big data analytics	• Cloud computing • HPC/data analytics • Data center applications
Features	• 2 x 2.5" hot-swappable SAS/SATA • 8 x DIMM slots (Intel® Optane™ DCPMM) • NVIDIA® Tesla P4/T4 optimized • Unified front bezel design	• 8 x 2.5" hot-swappable SAS/SATA • 24 x DIMM slots (Intel® Optane™ DCPMM) • 4 x double-deck or 8 x single-deck PCIe cards • Unified front bezel design
Processor	Dual 2nd Gen Intel® Xeon® Scalable processors with UPI up to 10.4 GT/s, TDP up to 140W	Dual 2nd Gen Intel® Xeon® Scalable processors with UPI up to 10.4 GT/s, TDP up to 140W
Serverboard	SKY-6100	SKY-6200
Chipset	Intel® C622	Intel® C622
Memory	8 x DDR4 2933 MHz ECC RDIMM/LRDIMM / Intel Optane DCPMM, up to 1TB	24 x DDR4 2933 ECC RDIMM/LRDIMM / Intel Optane™ DCPMM up to 4TB
Expansion Slots	5 x PCIe 3.0 x16 (FH/HL)	4 x PCIe 3.0 x16 (FH, 10.5", double deck) or 8 x PCIe 3.0 x8 (FH, 10.5", single deck); 1 x PCIe 3.0 x8 (FH/HL)
Onboard Storage Controller	Intel® C622 SATA3 (6Gb/s)	Intel® C622 SATA3 (6Gb/s)
Connectivity	2 x Intel® X557 10G Base-T + 1 x Intel® I210 Gigabit Ethernet, 1 x VGA, 3 x USB 3.2 Gen 1 (2 at rear, 1 x internal), 2 x USB 2.0 at front	2 x Intel® X557 10G Base-T + 2 x Intel® I210 Gigabit Ethernet, 1 x VGA, 4 x USB 3.2 Gen 1 (rear), 2 x USB 2.0 at front, 1 x serial port (optional)
Controller	ASPEED AST2500 BMC	ASPEED AST2500 BMC
Management	IPMI 2.0, KVM with shared NIC	IPMI 2.0, KVM with shared NIC
Peripheral Bays	2 x 2.5" hot-swappable drives, 2 x SAS/SATA 3, 1 x M.2 2242 SATA on board	8 x 2.5" hot-swappable drives, 8 x SAS/SATA 3 (optional ODD), 1 x M.2 2280 (SATA + PCIe x4) on board
Power Supply	1200W 1+1 platinum level redundant power supply	2000W 1+1 platinum level redundant power supply
Cooling System	6* 40 x 56 high-speed system fan, 1* 40 x 28 internal fan, 1* 40 x 28 external fan (optional)	6* 80 x 38 high-speed fan (2* for CPU, 4* for riser card cage)
Form Factor	1U chassis with enclosure (438 x 44 x 650 mm/ 17.2 x 1.7 x 25.6 in)	2U chassis with enclosure (438 x 88 x 760 mm/ 17.24 x 3.46 x 29.92 in)
Operating Temperature	0 ~ 35 °C/32 ~ 95 °F	0 ~ 35 °C/32 ~ 95 °F

	SKY-6400	SKY-6420	SKY-640V2
Key Applications	▪ Cloud computing ▪ Big data analytics ▪ High-end enterprise server	▪ Cloud computing ▪ Big data analytics ▪ Research/national laboratory	▪ Cloud computing ▪ Big data analytics ▪ High-end enterprise server
Features	▪ 8 x 2.5/3.5" hot-swappable SAS/SATA ▪ 12 x DIMM slots (Intel® Optane™ DCPMM) ▪ 205W CPU ▪ 6 x PCIe slots ▪ Unified front bezel design	▪ 12 x 2.5/3.5" hot-swappable SAS/SATA ▪ 24 x DIMM slots ▪ Hot-swappable system fan ▪ 11 x PCIe slots ▪ Peer-to-peer support	▪ 8 x 2.5/3.5" hot-swappable SAS/SATA ▪ 16 x DIMM slots (Intel® Optane™ DCPMM) ▪ 205W CPU ▪ 7 x PCIe slots ▪ Unified front bezel design
Processor	Dual 2nd Gen Intel® Xeon® Scalable processors with UPI up to 10.4 GT/s, TDP up to 205W	Dual 2nd Gen Intel® Xeon® Scalable processors with UPI up to 10.4 GT/s, TDP up to 160W	Dual 3rd Gen Intel® Xeon® Scalable processors with UPI up to 11.2 GT/s, TDP up to 205W
Serverboard	ASMB-975I	SKY-6420	ASMB-976T2
Chipset	Intel® C621	Intel® C622	Intel® C621A
Memory	12 x DDR4 2933 MHz ECC RDIMM/ LRDIMM / Intel Optane™ DCPMM, up to 2TB	24 x DDR4 2933 MHz ECC RDIMM/ LRDIMM / Intel Optane™ DCPMM, up to 6TB	16x DDR4 3200 MHz ECC RDIMM/ LRDIMM / Intel® Optane™ DCPMM up to 2TB
Expansion Slots	4 x PCIe 3.0 x16 (FH, 10.5", double deck); 1 x PCIe 3.0 x8 (FH, single deck); 1 x PCIe 3.0 x4 (FH, single deck)	10 x PCIe 3.0 x16 (FH, 10.5", double deck); 1 x PCIe 3.0 x16 (FH, single deck)	4 x PCIE 4.0 x16 (FH, 10.5" L, double deck); 3 x PCIE 4.0 x8 (FH/HL, single deck)
Onboard Storage Controller	Intel® C621 SATA3 (6Gb/s)	Intel® C622 SATA3 (6Gb/s)	Intel® C621A SATA3 (6Gb/s)
Connectivity	▪ 2 x Intel® I210 Gigabit Ethernet ▪ 1 x VGA ▪ 7 x USB 3.2 Gen 1 (4 x rear, 2 x front, 1 x type A) ▪ 1 x serial port	▪ 2 x Intel® X557 10G Base-T + 1 x Realtek RTL8201EL-VC PHY (dedicated IPMI) ▪ 1 x VGA ▪ 6 x USB 3.2 Gen 1 (4 x rear, 2 x front) ▪ 2 x serial ports (optional)	▪ 2 x Intel® X550 10G Base-T + 2 x Intel® I210 Gigabit Ethernet ▪ 1 x VGA ▪ 2 x USB 3.2 Gen 1 (rear) ▪ 2 x USB 3.2 Gen 1 (front) ▪ 1 x serial port
Controller	ASPEED AST2500 BMC	ASPEED AST2500 BMC	ASPEED AST2500 BMC
Management	IPMI 2.0, KVM with shared NIC LAN, SUSI API, WISE-PaaS/RMM	IPMI 2.0, KVM with dedicated LAN	IPMI 2.0, KVM with dedicated LAN
Peripheral Bays	▪ 8 x 2.5/3.5" hot-swappable SAS/SATA 3 ▪ 2 x 2.5" drives (internal) ▪ 2 x M.2 2242(SATA) on board for OS mirroring	▪ 12 x 2.5/3.5" hot-swappable SAS/SATA 3 ▪ 1 x M.2 2280 (SATA + PCIe x2) on board	▪ 8 x 2.5/3.5" hot-swappable SAS/SATA 3 ▪ 2 x 2.5" drives (internal) ▪ 2 x M.2 2280 (PCIe/SATA) on board for cache and OS mirroring ▪ Optional ODD at front panel
Power Supply	2000W 1+1 platinum level redundant power supply	4800W 3+1 platinum level redundant power supply	2000W 1+1 platinum level redundant power supply
Cooling System	▪ 2* CPU fan ▪ 3* 120 x 38 high-speed internal system fan ▪ 2* 80 x 38 high-speed external system fan	▪ 6* 120 x 38 high-speed system fan ▪ 4* 80 x 38 external fan (optional)	▪ 2* CPU fan ▪ 3* 120 x 38 high-speed internal system fan ▪ 2* 80 x 38 high-speed external system fan (optional)
Form Factor	4U chassis with enclosure (435 x 177 x 673 mm/ 17.12 x 6.96 x 26.49 in)	4U chassis with enclosure (438 x 176 x 770 mm/ 17.24 x 6.93 x 30.31 in)	4U chassis with enclosure (435 x 176 x 660 mm/ 17.12 x 6.9 x 25.9 in)
Operating Temperature	0 ~ 35 °C/32 ~ 85 °F (0 ~ 30 °C/32 ~ 85.9 °F with NVIDIA Tesla P100/V100)	0 ~ 35 °C/32 ~ 85 °F (0 ~ 30 °C/32 ~ 85.9 °F with NVIDIA Tesla V100)	0 ~ 35 °C/32 ~ 85 °F with NVIDIA A100/A30

Header navigation tabs:
1. Network Appliances
2. Servers, Server Boards and Chassis
3. Network Interface & Acceleration Cards
4. GPU Solutions
5. Video Infrastructure Solutions

Product columns:
☞ SKY-6400 ☞ SKY-6420 ☞ SKY-640V2

Video AI Platforms

Edge AI Computing

		☞ MIC-710AIL ☞ MIC-710AILT ☞ MIC-710AILX	☞ MIC-710AI ☞ MIC-710AIT ☞ MIC-710AIX	☞ MIC-730AI
NVIDIA® Platform		Jetson Nano/ Jetson TX2 NX/ Jetson Xavier NX	Jetson Nano/ Jetson TX2 NX/ Jetson Xavier NX	Jetson AGX Xavier
Processor	CPU	Nano: Arm® Cortex A57 quad-core (1.43 GHz) TX2 NX: Denver 2.0 dual-core + Arm® Cortex A57 quad-core NX: Carmel dual-core (1.9 GHz)		8-core NVIDIA Arm® v8.2 (64-bit) with 8 MB L2 + 4 MB L3
	CUDA Cores	Nano: 128 x Maxwell™ CUDA cores TX2 NX: 256 x Pascal™ CUDA cores NX: 384 x Volta™ CUDA cores, 48 x tensor cores		512 x Volta™ CUDA cores, 64 x tensor cores
	Memory	Nano: 4 GB 64-bit LPDDR4/TX2 NX: 8 GB 128-bit LPDDR4/NX: 8 GB 128-bit LPDDR4, 1600 Hz		32 GB 256-bit LPDDR4
	Flash	16 GB eMMC	16 GB eMMC	32 GB eMMC
I/O Expansion	LAN	1 x RJ-45	2 x RJ-45	2 x RJ-45
	PoE	–	–	–
	HDMI	1 x HDMI	1 x HDMI	1 x HDMI
	USB	External: 1 x USB 2.0, 1 x USB 3.0 Internal: 1 x USB 2.0, 1 x micro USB	External: 1 x USB 2.0, 1 x USB 3.0 Internal: 1 x USB 2.0, 1 x micro USB	External: 2 x USB 2.0, 2 x USB 3.0 Internal: 1 x USB 2.0
	DI/DO	–	8 (4 x input, 4 x output)	16 (8 x input, 8 x output)
	Buttons	1 x recovery, 1 x reset (internal)	1 x recovery, 1 x reset (internal)	1 x power, 1 x recovery, 1 x reset (external)
	COM	–	1 x RS-232/422/485	2 x RS-232/422/485
	SD Card	1 x Micro SD	1 x Micro SD	–
	SIM Card	–	–	–
	Mini PCIe	1 (PCIe x1)	1 (PCIe x1)	1 (PCIe x1)
	iDoor	✓ upon request	✓	✓
	PCIe iModule	–	–	MIC-75M10-00A1, MIC-75M20-00C1 (x16 Slots, x8 lanes)
Storage	Storage	1 x M.2 2280 (M-key, PCIe)	1 x M.2 (SATA)	1 x 2.5" HDD/SSD, 1 x M.2 (NVME PCIe x2)
Power	Power Supply	12 ~ 24 V$_{DC}$	19 ~ 24 V$_{DC}$	9 ~ 36 V$_{DC}$
Dimensions	(H x W x D)	85 x 118 x 45 mm/3.34 x 4.64 x 1.77 in	147 x 118 x 52 mm/5.78 x 4.64 x 2.04 in	192 x 230 x 87 mm/7.55 x 9.05 x 3.42 in
Operating Environment	Operating Temperature	-10 ~ 60 °C (14 ~ 140 °F) with 0.7 m/s air flow	-10 ~ 60 °C with 0.7 m/s air flow (Max-P ARM mode)	MODE_30W_ALL: -10~+60°C with 0.7 m/s air flow MAXN: -10~+55°C with 0.7 m/s air flow
	Vibration	3 Grms @ 5 ~ 500 Hz, random, 1 hr/axis	3 Grms @ 5 ~ 500 Hz, random, 1 hr/axis	0.5Grms @ 5 ~ 500 Hz, random, 1 hr/axis (With HDD)
	IP Rating	–	–	–

Rugged AI Systems and AI NVRs

		☞ MIC-715	☞ MIC-710IVA ☞ MIC-710IVX	☞ MIC-730IVA
NVIDIA® Platform		Jetson Xavier NX	Jetson Nano/Jetson Xavier NX	Jetson AGX Xavier
Processor	CPU	Carmel dual-core (1.9 GHz)	Nano: Arm® Cortex A57 quad-core (1.43 GHz) NX: Carmel dual-core (1.9 GHz)	8-core NVIDIA Arm® v8.2 (64-bit) with 8 MB L2 + 4 MB L3
	CUDA Cores	384 x Volta™ CUDA cores, 48 x tensor cores	Nano: 128 x Maxwell™ CUDA cores NX: 384 x Volta™ CUDA cores, 48 x tensor cores	512 x Volta™ CUDA cores, 64 x tensor cores
	Memory	8 GB 128-bit LPDDR4, 1600 Hz	Nano: 4 GB 64-bit LPDDR4 NX: 8 GB 128-bit LPDDR4, 1600 Hz	32 GB 256-bit LPDDR4
	Flash	16 GB eMMC	16 GB eMMC	32 GB eMMC
I/O Expansion	LAN	2 x M12 X-coded, 8-pin, female	1 x RJ-45	2 x RJ-45
	PoE	4 x M12 X-coded, 8-pin, female	8 x PoE	8 x PoE (15.4 w/ch)
	HDMI	1 x HDMI	1 x HDMI	1 x HDMI
	USB	External: 2 x USB 3.0 Internal: 1 x Micro USB	External: 1 x USB 2.0, 1 x USB 3.0 Internal: 1 x USB 2.0	External: 2 x USB 3.0 Internal: 1 x USB 3.0
	DI/O	–	8 (4 x input/4 x output)	8 (4 x input/4 x output)
	Buttons	1 x recovery, 1 x reset (internal)	1 x power (external), 1 x recovery, 1 x reset (internal)	1 x power (external), 1 x recovery, 1 x reset (internal)
	COM	2 x CAN (M12 A-coded, 5-pin, male)	1 x RS-485	2 x RS-232/422/485
	SD Card	1 x Micro SD	–	–
	SIM Card	1 x SIM slot	–	1 x SIM slot
	Mini PCIe	2 (PCIe x1)	–	1 (PCIe x1)
	M.2	1 x M.2 3052, 1 x M.2 2280	–	–
	iDoor	✓ upon request	–	–
	PCIe iModule	–	–	–
Storage	Storage	1x M.2 2280 (M-key, PCIe)	2 x 3.5" HDD (internal)	2 x 3.5" HDD (internal)
Power	Power Supply	12 ~ 24 V_{DC}	AC 100 ~ 240V 250W ATX	AC 100 ~ 240V 250W ATX
Dimensions	H x W x D	275 x 220 x 80 mm/ 10.82 x 8.66 x 3.14 in	57 x 300 x 330 mm/ 2.24 x 11.81 x 12.99 in	57 x 300 x 330 mm/ 2.24 x 11.81 x 12.99 in
Operating Environment	Operating Temperature	-25 ~ 60 °C with 0.7 m/s air flow (Max-P ARM mode)	0 ~ 40 °C with 0.7 m/s air flow	0 ~ 40 °C with 0.7 m/s air flow
	Vibration	3 Grms @ 5 ~ 500 Hz, random, 1 hr/axis	0.5 Grms @ 5 ~ 500 Hz, random, 1 hr/axis	0.5 Grms @ 5 ~ 500 Hz, random, 1 hr/axis
	IP Rating	IP67	–	–

NVIDIA GPU Cards

NVIDIA MXM GPU Cards

	☞ SKY-MXM-A2000	SKY-MXM-A1000	☞ SKY-MXM-RTX3000	☞ SKY-MXM-T1000
Part Number	SKY-MXM-A2000-4SDA	–	SKY-MXM-R3000-6SDA	SKY-MXM-T1000-4SDB
GPU Architecture	Ampere		Turing	
GPU Memory	4 GB GDDR6 with ECC	4 GB GDDR6	6 GB GDDR6	4 GB GDDR6
Memory Interface Max Clock	128 bit 7000 MHz	128 bit 7000 MHz	192 bit 7000 MHz	128 bit 6000 MHz
Memory BW	224 GB/s	192 GB/s	336 GB/s	192 GB/s
CUDA Cores	2560	2048	1920	896
RT Cores	20	16	30	–
Tensor Cores	80	64	240	–
Tensor TFLOPS (Dense/Sparse)	34/66	26/52	44/N/A	N/A
FP32 Performance	8.25 TF	6.66 TF	5.3 TF	2.7 TF
GPU Clock Boost Clock	1117 MHz 1612 MHz	1192 MHz 1624 MHz	945 MHz 1380 MHz	1395 MHz 1455 MHz
Form Factor	MXM Type A	MXM Type A	MXM Type B	MXM Type A
Dimensions (W X D)	82 x 70 mm/3.22 x 2.75 in	82 x 70 mm/3.22 x 2.75 in	82 x 70 mm/3.22 x 2.75 in	82 x 70 mm/3.22 x 2.75 in
Interface	MXM 3.1, PCIe 3.0 x8	MXM 3.1, PCIe 3.0 x8	MXM 3.1, PCIe 3.0 x16	MXM 3.1, PCIe 3.0 x16
TGP Power	60W	60W	80W	50W
Display Output	4 x DisplayPort 1.4a,4K @ 120 Hz or 8K @ 60 Hz (Require DSC) Support HDMI 2.0 via DP dual-mode, 4K @ 60Hz			
NVENC NVDEC	1 (7th Gen) 2 (5th Gen)	1 (7th Gen) 2 (5th Gen)	1 (7th Gen) 3 (4th Gen)	1 (6th Gen) 3 (4th Gen)
Operating Temperature	0 ~ 55 °C/32 ~ 131 °F (dependent on CPU and cooler)			
Storage Temperature	-40 ~ 85 °C/-40 ~ 185 °F			
Vibration	2G non-operating			
Operating System	Windows 10, Linux (64 bit)			

NVIDIA Tesla GPU Cards
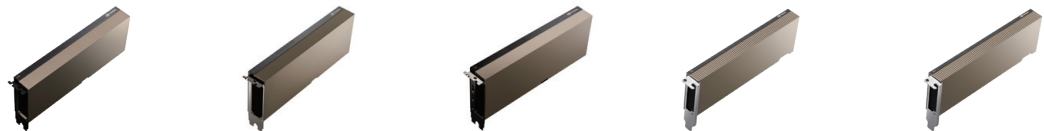
	NVIDIA A100 80GB	NVIDIA A30	NVIDIA A40	NVIDIA A16	☞ NVIDIA A2
Part Number	SKY-TESL-A100-80P	SKY-TESL-A30-24P	SKY-TESL-A40-48P	SKY-TESL-A16-64P	SKY-TESL-A2-16P
Form Factor	DS FH 3 NVLINK bridges	DS FH 1 NVLINK bridges	DS FH 1 NVLINK bridges	DS FH	SS LP
GPU Memory	80GB HBM2e	24 GB HBM2	48 GB GDDR6	4 x 16 GB GDDR6	16 GB GDDR6
Memory Bandwidth	1935 GB/s	933 GB/s	700 GB/s	–	200 GB/s
Multi-Instance GPU	Up to 7	Up to 4	N/A	N/A	N/A
Media Acceleration	1 x JPEG decoder, 5 x video decoders	1 x JPEG decoder, 4 x video decoder	1 x video encoder, 2 x video decoder (+AV1 decode)	4 x video encoder, 8 x video decoder (+AV1 decode)	1 x video encoder, 2 x video decoder
Ray Tracing	No	No	Yes	Yes	Yes
Fast FP64	Yes	Yes	No	No	No
DL & Compute	Ultimate	Fastest	Fastest	Fast	Fast
Graphics	For in-situ visualization (no vPC/vQuadro)	For in-situ visualization (no vPC/vQuadro)	Best	Good	Good
Max Power	300W	165W	300W	250W	40 ~ 60W

NVIDIA Quadro GPU Cards

	☞ NVIDIA RTX A6000	☞ NVIDIA RTX A5000	☞ NVIDIA RTX A4500	☞ NVIDIA RTX A4000	☞ NVIDIA RTX A2000 12GB	☞ NVIDIA RTX A2000	☞ NVIDIA T1000 8GB	☞ NVIDIA T1000	☞ NVIDIA T400 4GB
Part Number	SKY-QUAD-RTXA6000B	SKY-QUAD-RTXA5000B	SKY-QUAD-RTXA4500B	SKY-QUAD-RTXA4000B	SKY-QUAD-A2000-12B	SKY-QUAD-RTXA2000B	SKY-QUAD-T1000-8-B	SKY-QUAD-T1000-AB	SKY-QUAD-T400-4-B
GPU Architecture	Ampere						Turing		
Memory Size	48 GB GDDR6 w/ECC	24 GB GDDR6 w/ECC	20 GB GDDR6 w/ECC	16 GB GDDR6 w/ECC	12 GB GDDR6 w/ECC	6 GB GDDR6 w/ECC	8 GB GDDR6	4 GB GDDR6	4 GB GDDR 6
Memory Interface	384 bit	384 bit	320 bit	256 bit	192 bit		128 bit		64 bit
Memory Bandwidth	768 GB/s	768 GB/s	640 GB/s	512 GB/s	288 GB/s		160 GB/s		80 GB/s
CUDA Cores	10,752	8,192	7,168	6,144	3,328		896		384
Tensor Cores	336	256	224	192	104		–		–
RT Cores	84	64	56	48	26		–		–
Single-Precision Performance	38.7 TFLOPS	27.8 TFLOPS	23.7 TFLOPS	19.2 TFLOPS	8.0 TFLOPS		2.5 TFLOPS		1.09 TFLOPS
RT Cores Performance	75.6 TFLOPS	54.2 TFLOPS	46.2 TFLOPS	37.4 TFLOPS	15.6 TFLOPS		–		–
Tensor Performance	309.7 TFLOPS	222.2 TFLOPS	189.2 TFLOPS	153.4 TFLOPS	63.9 TFLOPS		–		–
Graphics Bus	PCIe 4.0 x16	PCIe 4.0 x16	PCIe 4.0 x16	PCIe 4.0 x16	PCIe 4.0 x16		PCIe 3.0 x16		PCIe 3.0 x16
Max Power	300W	230W	200W	140W	70W		50W		30W
Dimensions (H x L)	111.76 x 266.7 mm /4.4 x 10.5 in			111.76 x 241.3 mm/4.4 x 9.5 in	68.58 x 167.6 mm/2.7 x 6.6 in		68.83 x 155 mm/2.71 x 6.13 in		68.83 x 155 mm/2.71 x 6.13 in
Form Factor	Dual slots, full height			Single slot, full height	Dual slots, low profile		Single slot, low profile		Single slot, low profile
Display Connectors	4 x DP 1.4	4 x DP 1.4	4 x DP 1.4	4 x DP 1.4	4 x mDP 1.4 with latching mechanism		4 x mDP 1.4 with latching mechanism		3 x mDP 1.4 with latching mechanism
Thermal Solution	Active								
Operating Temperature	0 ~ 45 °C/ 32 ~ 113 °F	0 ~ 45 °C/ 32 ~ 113 °F	0 ~ 45 °C/ 32 ~ 113 °F	0 ~ 50 °C/ 32 ~ 122 °F	0 ~ 50 °C/32 ~ 122 °F		0 ~ 55 °C/32 ~ 131 °F		0 ~ 55 °C/ 32 ~ 131 °F
Storage Temperature	-45 ~ 75 °C/-49 ~ 167 °F								
Max Simultaneous Displays	4 x 4096 x 2160 @ 120 Hz 4 x 5120 x 2880 @ 60 Hz 2 x 7680 x4320 @ 60 Hz	4 x 4096 x 2160 @ 120 Hz 4 x 5120 x 2880 @ 60 Hz 2 x 7680 x4320 @ 60 Hz	4 x 4096 x 2160 @ 120 Hz 4 x 5120 x 2880 @ 60 Hz 2 x 7680 x4320 @ 60 Hz	4 x 4096 x 2160 @ 120 Hz 4 x 5120 x 2880 @ 60 Hz 2 x 7680 x4320 @ 60 Hz	4 x 4096 x 2160 @ 120 Hz 4 x 5120 x 2880 @ 60 Hz 2 x 7680 x 4320 @ 60 Hz		4 x 3840 x 2160 @ 120 Hz 4 x 5120 x 2880 @ 60 Hz 2 x 7680 x 4320 @ 60 Hz		3 x 3840 x 2160 @ 120 Hz 3 x 5120 x 2880 @ 60 Hz
Graphics APIs	DirectX 12.07 Shader Model 5.17 OpenGL 4.68 Vulkan 1.18	DirectX 12.07 Shader Model 5.17 OpenGL 4.68 Vulkan 1.2	DirectX 12.07 Shader Model 5.17 OpenGL 4.68 Vulkan 1.2	DirectX 12.07 Shader Model 5.17 OpenGL 4.68 Vulkan 1.2	DirectX 12.07 Shader Model 5.17 OpenGL 4.68 Vulkan 1.2		DirectX 12.07 Shader Model 5.17 OpenGL 4.68 Vulkan 1.2		DirectX 12.07 Shader Model 5.17 OpenGL 4.68 Vulkan 1.2
Compute APIs	CUDA, DirectCompute, OpenCL™								
Media Acceleration	1 x NVENC, 2 x NVDEC (+AV1 dec)	1 x NVENC, 2 x NVDEC (+AV1 dec)	1 x NVENC, 2 x NVDEC (+AV1 dec)	1 x NVENC, 2 x NVDEC (+AV1 dec)	1 x NVENC, 2 x NVDEC (+AV1 dec)		1 x NVENC, 2 x NVDEC		1 x NVENC, 2 x NVDEC
NVLink	Yes	Yes	Yes	No	No		No		No
Virtualization Ready	Yes	Yes	No	No	No		No		No
Power Connector	8-pin CPU	8-pin PCIe	8-pin PCIe	6-pin PCIe	–		–		–

# 5

Video Infrastructure Solutions

New IP Video Infrastructure

Advantech's VEGA video platforms and PCI Express accelerators are designed to enhance performance (from video collection through to distribution), minimize power consumption, and satisfy diverse multimedia/broadcasting needs. By integrating the latest 4K/8K video processing and IP media technologies into commercial-off-the-shelf platforms, we offer efficient next-generation solutions that can be quickly deployed for a wide range of media applications. Such applications include broadcast encoding, cloud-based OTT transcoding, as well as mobile and 360° video. With proven expertise in the fields of networking and computing, Advantech continues to drive innovation in the transition to IP technologies.

IP Network Migration

One of the main challenges currently facing the media industry is the growing trend for IP network migration. The benefits of transitioning include increased flexibility, reduced cost, and greater use of commercial hardware. Advantech is accelerating this transition by collaborating with key partners through industry alliances, such as the AIMS Alliance, to develop standard and interoperable solutions that unlock the full potential of the new IP network infrastructure.
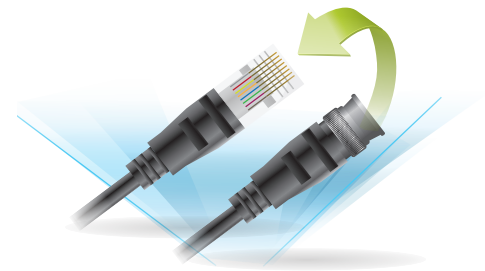
Ultra HD and HEVC

The emergence of 4K/8K resolutions combined with the H.265 coding standard significantly outstrip the processing capabilities of much existing infrastructure. Accordingly, Advantech offers a wide range of ultra-low-power video acceleration cards and application-ready platforms capable of scaling the throughput of high-density video infrastructure solutions to enable next-generation Ultra HD applications.

SDVoE Innovation

The SDVoE Alliance is a dedicated group of AV manufacturers, system designers, integrators, and technology managers working together to accelerate the replacement of point-to-point connectivity and the matrix switch with Ethernet-based AV distribution. Through interoperability and standardization, SDVoE platforms can deliver optimal AV usage experiences.

UHD Video Converters

Model			☞ VEGA-1000	☞ VEGA-1100	VEGA-1101	☞ VEGA-1200
Product Lifespan			5 years	5 years	5 years	5 years
Platform			Appliance	AVP2000T	Appliance	AVP2000T
Video Inputs and Outputs	Channels (Max.)		1	1	1	1
	Formats	Resolution	480i/480p/720p/1080i/1080p/4K2K	480i/480p/720p/1080i/1080p/4K2K	VGA: 640x480 (4:3) SXGA: 1280x1024 (5:4) 1080p/i: 1920x1080 (16:9) SVGA: 800x600 (4:3) WXGA: 1366x768 (16:9) QXGA: 2048x1536 (4:3) XGA: 1024x768 (4:3) SXGA+: 1440x1080 (4:3) Ultra HD: 3840x2160 (16:9) HDTV: 1280x720 (16:9) UXGA: 1600x1200 (4:3) -/ 4K: 4096x2160 (17:9)	480i/480p/720p/1080i/1080p/4K2K
		Frame Rate	up to 4K60	up to 4K60	up to 4K60	up to 4K60
	Chroma Sampling Format		4:4:4	4:4:4	4:4:4	4:4:4
	Bit Depth		8 bit, 10 bit, 12 bit	8 bit, 10 bit, 12 bit	24 bit, 30 bit, 36 bit, 48 bit	8 bit, 10 bit, 12 bit
	Input Interface		HDMI 2.0	HDMI 2.0	HDMI 2.0 (Optional: 3G-SDI, DP)	HDMI 2.0, DP, 12G-SDI, S-Video, VGA
	Output Interface		HDMI 2.0	HDMI 2.0	HDMI 2.0	HDMI 2.0
Video Coding	Video Decoding	Standard	AVX	SDVoE	SDVoE	SDVoE, HEVC, AVC
		Bit Depth	8 bit, 10 bit, 12 bit	8 bit, 10 bit, 12 bit	8 bit, 10 bit, 12 bit	8 bit, 10 bit, 12 bit
		Chroma Subsampling	4:4:4/4:2:2/4:2:0	4:4:4/4:2:2/4:2:0	4:4:4/4:2:2/4:2:0	4:4:4/4:2:2/4:2:0
		Standard	AVX	SDVoE	SDVoE	SDVoE
		Bit Depth	8 bit, 10 bit, 12 bit	8 bit, 10 bit, 12 bit	8 bit, 10 bit, 12 bit	8 bit, 10 bit, 12 bit
		Chroma Subsampling	4:4:4/4:2:2/4:2:0	4:4:4/4:2:2/4:2:0	4:4:4/4:2:2/4:2:0	4:4:4/4:2:2/4:2:0
VoIP	Connectivity		1 x 10 GbE (SFP+ cages), 1 x 10 GbE copper, 1 GbE copper	1 x 10 GbE (SFP+ cages), 1 x 10 GbE copper, 1 GbE copper	1 x 10 GbE (SFP+ cages), 1 x 1 GbE copper	1 x 10 GbE (SFP+ cages), 1 x 1 GbE copper
	Standard Supported		AVX	SDVoE	SDVoE	SDVoE, NDI, SRT
Audio	Channels (Max.)		8	8	8	8
	Formats		Stereo Multi-channel linear PCM up to 8 channels (7:1)	Stereo Multi-channel linear PCM up to 8 channels (7:1)	Stereo Multi-channel linear PCM up to 8 channels (7:1)	Stereo Multi-channel linear PCM up to 8 channels (7:1)
	Audio Connectors		1 x input, 1 x output	1 x input, 1 x output	1 x input (encoder), 1 x output (decoder)	1 x input, 1 x output
Functionality	Operating System		Linux	Linux	Linux	Linux
	Streaming Protocol		AVX	SDVoE	SDVoE	SDVoE, NDI, SRT
	Management & Control Interface		Local or remote control GUI interface	Local or remote control GUI interface	Local or remote control GUI interface	Local or remote control GUI interface
	Development Kits		Semtech AVX	Semtech BlueRiver	–	Semtech BlueRiver
	Local Video Output		HDMI 2.0	HDMI 2.0	HDMI 2.0 (decoder)	HDMI 2.0
	Network Interface		10 GbE SFP+ fiber, 10 GbE copper, 1 GbE copper	10 GbE SFP+ fiber, 10 GbE copper, 1 GbE copper	10 GbE SFP+ fiber, 1 GbE copper	10 GbE SFP+ fiber, 1 GbE copper
	USB		3 x USB 1.0 type A HID	3 x USB 1.0 type A HID	1 x USB 2.0 type B (encoder) 2 x USB 2.0 type A (decoder)	1 x USB 2.0 type A 1 x USB 1.0 type A HID
Power	Power Input		12 V DC	12 V DC	12 V DC	12 V DC
	Power Consumption		12.5 W	12.5 W	16 W (encoder) 12 W (decoder)	12.5 W
Mechanical	Dimensions		172 x 162 x 30 mm/ 6.77 x 6.37 x 1.18 in	172 x 162 x 30 mm/ 6.77 x 6.37 x 1.18 in	166 x 228 x 43 mm/ 6.5 x 8.97 x 1.69 in (encoder) 163 x 175 x 43 mm/ 6.41 x 6.88 x 1.69 in (decoder)	266 x 210 x 47.5 mm/ 10.47 x 8.26 x 1.87 in

4K Live Video Streaming Over WAN

			VEGA-2002-12GS	VEGA-2002-3GS	VEGA-2002-4x3GS	VEGA-2002R-4x3GS
Model			☞ VEGA-2002-12GS	☞ VEGA-2002-3GS	☞ VEGA-2002-4x3GS	☞ VEGA-2002R-4x3GS
Product Lifespan			5 years	5 years	5 years	5 years
Platform			Ambarella H2+ Xilinx Kintex-7 FPGA	Ambarella H2+ Xilinx Kintex-7 FPGA	Ambarella H2+ Xilinx Kintex-7 FPGA	Ambarella H2+ Xilinx Kintex-7 FPGA
Video Inputs and Outputs	Channels (Max.)		2	2	4	4
	Formats	Resolution	HDMI 2.0 3840 x 2160: 60p, 59.94p, 50p, 30p, 29.97p, 25p 1920 x 1080: 60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 60i, 59.94i, 50i 1280 x 720: 60p, 59.94p, 50p BNC (12G-SDI) 3840 x 2160: 60P, 59.94p, 50p, 30p, 29.97p 1920 x 1080: 60p, 59.94p, 50p, 30p, 29.97p, 25p, 60i, 59.94i, 50i 1280 x 720: 60p, 59.94p, 50p, 30p, 29.97p, 25p	HDMI 2.0 3840 x 2160: 60p, 59.94p, 50p, 30p, 29.97p, 25p 1920 x 1080: 60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 60i, 59.94i, 50i 1280 x 720: 60p, 59.94p, 50p BNC (3GS-SDI) 1920 x 1080: 60p, 59.94p, 50p, 30p, 29.97p, 25p, 60i, 59.94i, 50i 1280 x 720: 60p, 59.94p, 50p, 30p, 29.97p, 25p	BNC (3GS-SDI) 3840 x 2160: 60P, 59.94p, 50p, 30p, 29.97p 1920 x 1080: 60p, 59.94p, 50p, 30p, 29.97p, 25p, 60i, 59.94i, 50i 1280 x 720: 60p, 59.94p, 50p, 30p, 29.97p, 25p (Note: 3840 x 2160 support via quad link 3G-SDI)	BNC (3GS-SDI) 3840 x 2160: 60P, 59.94p, 50p, 30p, 29.97p 1920 x 1080: 60p, 59.94p, 50p, 30p, 29.97p, 25p, 60i, 59.94i, 50i 1280 x 720: 60p, 59.94p, 50p, 30p, 29.97p, 25p (Note: 3840 x 2160 support via quad link 3G-SDI)
		Frame Rate	Up to 4K60	Up to 4K60	Up to 4K60	Up to 4K60
	Chroma Sampling Format		4:2:2	4:2:2	4:2:2	4:2:2
	Bit Depth		8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit
	Input Interface		1 x 12G-SDI 1 x HDMI 2.0	1 x 3G-SDI 1 x HDMI 2.0	4 x 3G-SDI	4 x 3G-SDI
	Output Interface		HDMI 2.0	HDMI 2.0	HDMI 2.0	HDMI 2.0
Video Coding	Video Decoding	Video Encoding	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)
		Bit Depth	8 bit, 10 bit (only HEVC)	8 bit, 10 bit (only HEVC)	8 bit, 10 bit (only HEVC)	8 bit, 10 bit (only HEVC)
		Chroma Subsampling	4:2:0	4:2:0	4:2:0	4:2:0
Audio	Formats		Line-In: stereo 12G(3G)-SDI: 2 stereo HDMI: 2 stereo	Line-In: stereo 3G-SDI: 4 stereo HDMI: 4 stereo	Line-In: stereo 3G-SDI: 2 stereo (supports only the SDI next to Line-In)	Line-In: stereo 3G-SDI: 2 stereo (supports only the SDI next to Line-In)
	Sampling Frequency		HDMI, SDI: 44.1, 48 KHz Line-In: 32, 44.1, 48 KHz	HDMI, SDI: 44.1, 48 KHz Line-In: 32, 44.1, 48 KHz	HDMI, SDI: 44.1, 48 KHz Line-In: 32, 44.1, 48 KHz	HDMI, SDI: 44.1, 48 KHz Line-In: 32, 44.1, 48 KHz
	Sampling Bit Depth		16 bit	16 bit	16 bit	16 bit
	Audio Connectors		1 x Input	1 x Input	1 x Input	1 x Input
Functionality	Operating System		Linux	Linux	Linux	Linux
	Streaming Protocol		RTSP, RTP, RTMP, HLS, TS over IP, SRT, NDI HX2 (optional)	RTSP, RTP, RTMP, HLS, TS over IP, SRT, NDI HX2 (optional)	RTSP, RTP, RTMP, HLS, TS over IP, SRT, NDI HX2 (optional)	RTSP, RTP, RTMP, HLS, TS over IP, SRT, NDI HX2 (optional)
	Management & Control Interface		Remote from web GUI interface	Remote from web GUI interface	Remote from web GUI interface	Remote from web GUI interface
	Local Video Output		HDMI 2.0	HDMI 2.0	HDMI 2.0	HDMI 2.0
	Network Interface		RJ45	RJ45	RJ45	RJ45
	USB		2 x USB 1.0 type A	2 x USB 1.0 type A	2 x USB 1.0 type A	2 x USB 1.0 type A
Power	Power Input		12 V DC	12 V DC	12 V DC	12 V DC
	Power Consumption		17.8 W	17.8 W	17.8 W	17.8 W
Mechanical	Dimensions		130 x 48 x 93 mm/ 5.11 x 1.88 x 3.66 in	130 x 48 x 93 mm/ 5.11 x 1.88 x 3.66 in	130 x 48 x 93 mm/ 5.11 x 1.88 x 3.66 in	122 x 43 x 92 mm/ 4.8 x 1.69 x 3.62 in

IP Video & Capture Cards

Model	VEGA-3003	☞ VEGA-3304	☞ VEGA-3311	VEGA-3321
Product Lifespan	5 years	5 years	5 years	5 years
Platform	Xilinx UltraScale+	Xilinx Virtex UltraScale+ Socionext M31	Xilinx UltraScale Socionext M30	Xilinx Virtex UltraScale+ Socionext M30

Video Inputs and Outputs			VEGA-3003	VEGA-3304	VEGA-3311	VEGA-3321
	Channels (Max.)		2 (up to 4Kp60)	1 (up to 8Kp60) or 4 (up to 4Kp60)	1 (up to 4Kp60)/ 4 (up to 1080p60)	1 (up to 4Kp60)/ 4 (up to 1080p60)
	Formats	**Resolution**	3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480	7680 x 4320, 3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480	3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480	3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480
		Frame Rate	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 59.94i, 50i	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 59.94i, 50i	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 59.94i, 50i
	Chroma Sampling Format		4:4:4, 4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0
	Bit Depth		8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit
	Input Interface		2 x HDMI 2.0/ 1 x HDMI 2.0, 1 x SDVoE	16 x SDI-3G	4 x SDI-3G/1 x SDI-12G, 2 x 10 GigE (VEGA-3311-I)	4 x SDI-3G/1 x SDI-12G, 2 x 25 GigE (VEGA-3321-I)
	Output Interface		PCIe Gen3 x8	PCIe Gen3 x16	PCIe Gen3 x8	PCIe Gen3 x8
Video Coding	**Video Encoding**		–	H.265 (HEVC)	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)
	Bit Depth		–	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit
	Chroma Subsampling		–	4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0
	Video Decoding	**Standard**	–	–	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)
		Bit Depth	–	–	8 bit, 10 bit	8 bit, 10 bit
		Chroma Subsampling	–	–	4:2:2, 4:2:0	4:2:2, 4:2:0
VoIP	**Connectivity**		–	–	2 x 10 GigE (SFP+ cages)	2 x 10 GigE (SFP+ cages)
	Standard Supported		–	–	SMPTE 2110 w/ AES67 audio & SMPTE 2059 sync	SMPTE 2110 w/ AES67 audio & SMPTE 2059 sync
Audio	**Channels (Max.)**		8/16 channels	–	8/16 channels	8/16 channels
	Sampling Frequency		48 KHz/96 KHz	–	48 KHz/96 KHz	48 KHz/96 KHz
	Sampling Bit Depth		16 bit	–	16 bit	16 bit
Functionality	**Operating System**		Windows, Linux	Linux	Windows, Linux	Windows, Linux
	Development Kits		FFmpeg, Microsoft DirectShow	FFmpeg	FFmpeg, Microsoft DirectShow	FFmpeg, Microsoft DirectShow
Power	**Power Consumption**		< 15 W	< 70 W	< 35 W	< 50 W
Mechanical	**Form Factor**		PCIe (HL/FH)	PCIe, 3/4 length, full height	PCIe (HL/FH)	PCIe (HL/FH)
	Dimensions		167.65 x 111.15 mm/ 6.6 x 4.37 in	234 x 111.15 x 41.19 mm/ 9.21 x 4.37 x 1.62 in	167.65 x 111.15 mm/ 6.6 x 4.37 in	167.65 x 111.15 mm/ 6.6 x 4.37 in

Accelerator Cards

		VEGA-3310	VEGA-3314	VEGA-3318	VEGA-3500
Model		☞ VEGA-3310	☞ VEGA-3314	☞ VEGA-3318	☞ VEGA-3500
Product Lifespan		5 years	5 years	5 years	5 years
Platform		Socionext M30	Socionext M30	Socionext M30	Intel Xe Graphic
Video Inputs and Outputs	Channels (Max.)	2 (Up to 4Kp60) / 8 (Up to 1080p60)	4 (Up to 4Kp60) / 16 (Up to 1080p60)	8 (Up to 4Kp60) / 32 (Up to 1080p60)	4 (Up to 4Kp60) / 16 (Up to 1080p60)
	Formats — Resolution	3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480	3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480	3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480	3840 x 2160, 1920 x 1080, 1280 x 720, 720 x 480
	Frame Rate	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 59.94i, 50i	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 59.94i, 50i	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 59.94i, 50i	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 59.94i, 50i
	Chroma Sampling Format	4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0
	Bit Depth	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit
	Input Interface	PCIe Gen3 x8	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen3 x16
	Output Interface	PCIe Gen3 x8	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen3 x16
Video Coding	Video Encoding — Standard	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)/ VP9
	Video Encoding — Bit Depth	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit
	Video Encoding — Chroma Subsampling	4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0	4:4:4, 4:2:2, 4:2:0
	Video Decoding — Standard	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)/ VP9/AV1
	Video Decoding — Bit Depth	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit	8 bit, 10 bit
	Chroma Subsampling	4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0	4:2:2, 4:2:0
Functionality	Operating System	Windows, Linux	Windows, Linux	Windows, Linux	Linux
	Development Kits	FFmpeg, Microsoft DirectShow	FFmpeg, Microsoft DirectShow	FFmpeg, Microsoft DirectShow	FFmpge
Power	Power Consumption	< 35 W	< 35 W	< 65 W	< 75 W
Mechanical	Form Factor	PCIe (HL/FH)	PCIe (3/4L/FH), double stack	PCIe (3/4L/FH), double stack	PCIe (3/4L/FH), double stack
	Dimensions	167.65 x 111.15 mm/ 6.6 x 4.37 in	266.7 x 111.15 mm/ 10.5 x 4.37 in	266.7 x 111.15 mm/ 10.5 x 4.37 in	266.7 x 111.15 mm/ 10.5 x 4.37 in
I/O or PCIe Interface		PCIe Gen3 x8	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen4 x16

FPGA Accelerators

Model	☞ VEGA-4000	☞ VEGA-4002	☞ VEGA-540	☞ VEGA-550
Product Lifespan	5 years	5 years	5 years	5 years
Platform	Xilinx Virtex® UltraScale+ XCVU9P FPGA	2 x Xilinx Virtex® ItraScale+ XCVU9P FPGA	Xilinx Zynq® UltraScale+ ZU7EV MPSoC FPGA	4 x Xilinx Zynq® UltraScale+ ZU7EV MPSoC FPGA
Memory	4-channel 4 GB/64 bit DDR4 2400 MHz with ECC	4-channel 4 GB/64 bit DDR4 2400 MHz with ECC per FPGA device	4 GB/64 bit DDR4 2400 MHz (PS side) + 4 GB/64 bit DDR4 2666 MHz (PL side)	8 GB/64 bit DDR4 2400 MHz (PS side) and 8 GB/64 bit DDR4 2666 MHz (PL side) per ZU7EV
Video Inputs and Outputs — Channels (Max.)	Dependant on the integrated IP	Dependant on the integrated IP	Integrated video codec unit, up to 4 x channel 4Kp60	Integrated video codec unit, up to 4 x channel 4Kp60 per ZU7EV
Chroma Sampling Format	–	–	4:2:2	4:2:2
Bit Depth	–	–	10 bit	10 bit
Input Interface	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen3 x16
Output Interface	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen3 x16
Video Coding — Video Encoding / Standard	Dependant on the integrated IP	Dependant on the integrated IP	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)
Video Decoding / Standard	–	–	H.265 (HEVC)/H.264 (AVC)	H.265 (HEVC)/H.264 (AVC)
Functionality — Operating System	–	–	Linux	Linux
Development Kits	Reference designs available	Reference designs available	Xilinx SDK, RPC SDK, FFmpeg, DNNDK	Xilinx SDK, RPC SDK, FFmpeg, DNNDK
Power — Power Consumption	< 75 W	< 225 W	< 40 W	< 150 W
Mechanical — Form Factor	PCIe (HL/HH)	PCIe (3/4L/FH)	PCIe (HL/HH)	PCIe (3/4L/FH)
Programmable Functionality — System Logic Cells (K)	2586 per FPGA device	2586 per FPGA device	504 per FPGA device	504 per FPGA device
CLB Flip-Flops (K)	2364 per FPGA device	2364 per FPGA device	461 per FPGA device	461 per FPGA device
CLB LUTs (K)	1182 per FPGA device	1182 per FPGA device	230 per FPGA device	230 per FPGA device
DSP Slices	6840 per FPGA device	6840 per FPGA device	1728 per FPGA device	1728 per FPGA device
Memory	N/A	N/A	Total block RAM/URAM (Mb): 11.0/27.0	Total block RAM/URAM (Mb): 11.0/27.0
I/O or PCIe Interface	PCIe Gen3 x16	PCIe Gen3 x16	PCIe Gen3 x16, 1 x USB 3.0, 1 x mini DisplayPort	PCIe Gen3 x16, 1 x RJ45 GbE-to-FPGA0, 1 x USB 3.0 for each FPGA

4K Real-Time Video Appliances

Model	☞ VEGA-6301	☞ VEGA-6301M
Product Lifespan	2 years	5 years
Video Inputs and Outputs — Channels (Max.)	1 (up to 4Kp60)/4 (up to 1080p60)	1 (up to 4Kp60)/4 (up to 1080p60)
Formats — Resolution	3840 x 2160, 1920 x 1080, 1280 x 720	3840 x 2160, 1920 x 1080, 1280 x 720
Formats — Frame Rate	60p, 59.94p, 50p, 30p, 29.97p, 25p	60p, 59.94p, 50p, 30p, 29.97p, 25p
Chroma Sampling Format	4:2:2, 4:2:0	4:2:2, 4:2:0
Bit Depth	8 bit, 10 bit	8 bit, 10 bit
Input Interface	1 x SDI-12G/1 x HDMI 2.0/4 x SDI-3G	1 x SDI-12G/1 x HDMI 2.0/4 x SDI-3G
Video Coding — Video Encoding — Video Encoding	H.265 (HEVC)	H.265 (HEVC)
Video Encoding — Bit Depth	8 bit, 10 bit	8 bit, 10 bit
Video Encoding — Chroma Subsampling	4:2:2, 4:2:0	4:2:2, 4:2:0
VoIP — Connectivity	2 x 10 GbE (SFP+ cages)	–
Standard Supported	ST 2022-5/6/7, ST 2059	–
Audio — Channels (Max.)	16	16
Formats	PCM	PCM
Sampling Frequency	48/96 KHz	32 ~ 192 KHz
Sampling Bit Depth	16 bit	24 bit
Audio Connectors	Embedded via HDMI/SDI	Embedded via HDMI/SDI
Functionality — Operating System	Linux	Linux
Streaming Protocol	RTP, MPEG, JDP, IP	RTP, MPEG, JDP, IP
Management & Control Interface	Local or remote control GUI interface	Local or remote control GUI interface
Development Kits	FFmpeg, Microsoft DirectShow	FFmpeg, Microsoft DirectShow
System Characteristics — Processor	Intel® Core™ i7-6820EQ/i5-6440EQ/i3-6100E	Intel® Core™ i7-7820EQ/i5-7440EQ/i3-7100E
Memory	8 GB default (up to 16 GB upon request)	8 GB default (up to 16 GB upon request)
Storage	32 GB mSATA	128 GB M.2 SSD
Local Video Output	1 x HDMI 2.0	1 x HDMI 2.0
Network Interface	2 x GbE port	2 x GbE port
USB	2 x USB 3.0	2 x USB 3.0
Power — Power Input	12 V DC	12 V DC
Power Consumption	75W based on Intel® Core™ i3 SOM	75W based on Intel® Core™ i3 SOM
Mechanical — Dimensions	214 x 289.7 x 42.8 mm/8.42 x 11.4 x 1.68 in	269 x 289.8 x 42.8 mm/10.59 x 11.4 x 1.68 in

UHD Edge Video Servers

Model	☞ <u>VEGA-7020</u>	VEGA-7110
Product Lifespan	5 years	5 years
Platform	Intel® Xeon® W-1270E	Intel® Core™ i7-1185G7E
Input Interface	Gen3 x 4/8/16	Gen3 x 4/8/16
Output Interface	Gen3 x 4/8/16	Gen3 x 4/8/16
System Characteristics — System Memory	Up to 64 GB (2 channels)	Up to 64 GB (2 channels)
System Characteristics — Storage	2 x NVME M.2 SSD 2 x 2.5" SSD	2 x NVME M.2 SSD 2 x 2.5" SSD
System Characteristics — Local Video Output	1 x HDMI 2.0 or 1 x VGA	2 x HDMI 2.0
System Characteristics — Network Interface	4 x GbE port	2 x GbE port
System Characteristics — USB	4 x USB 3.0	2 x USB 3.0, 2 x USB 2.0
Power — Power Input	100 ~ 240 V AC	100 ~ 240 V AC
Power — Power Consumption	80W (with Intel® Xeon® W-1270E CPU)	50W (with Intel® Core™ i7-1185G7E CPU)
Mechanical — Dimensions	44.4 x 438 x 560 mm/1.74 x 17.24 x 22 in	44.4 x 438 x 560 mm/1.74 x 17.24 x 22 in

8K Real-Time Video Appliances

Network
Appliances 1

Servers,
Server Boards
and Chassis 2

Network
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	Model		☞ VEGA-8300E	☞ VEGA-8300D	☞ VEGA-8301D
Video Inputs and Outputs	Channels (Max.)		1 (up to 8Kp60)	–	–
	Formats	Resolution	7680 x 4320	7680 x 4320	7680 x 4320
		Frame Rate	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p
	Chroma Sampling Format		4:2:2, 4:2:0	–	–
	Bit Depth		8 bit, 10 bit	–	–
	Input Interface		4 x 12G-SDI	4 x DisplayPort	4 x 12G-SDI
Video Coding	Video Encoding	Standard	HEVC (H.265)	–	–
		Bit Depth	8 bit, 10 bit	–	–
		Chroma Subsampling	4:2:2, 4:2:0	–	–
	Video Decoding	Standard	–	HEVC (H.265)	HEVC (H.265)
		Bit Depth	–	8 bit, 10 bit	10 bit
		Chroma Subsampling	–	4:2:0	4:2:2, 4:2:0
Audio	Channels		Up to 22.2 max.	Up to 22.2 max.	Up to 22.2 max.
	Formats		Input: AAC, AAC-LC Output: PCM	Input: AAC, AAC-LC Output: PCM	Input: AAC, AAC-LC Output: PCM
	Sampling Frequency		48 KHz	48 KHz	48 KHz
	Audio Connectors		SDI Audio	SDI Audio	SDI Audio
Functionality	Operating System		Linux	Windows	Windows
	Streaming Protocol		RTMP/HLS/RTP/TS over TCP, UDP (with FFmpeg support)	HLS or RTP	HLS or RTP
	Management & Control Interface		Local and remote web GUI interface	Local and remote web GUI interface	Local and remote web GUI interface
System Characteristics	System Memory		16 GB	16 GB	Up to 48 GB (2 channels)
	Storage		2 x 2.5" 1TB 7KRPM SATA3 (SSD/HDD)	2 x 2.5" 1TB 7KRPM SATA3 (SSD/HDD)	2 x NVME M.2 SSD, 2 x 2.5" SSD
	Local Video Output		1 x DP 1.4, 1 x HDMI 1.4	1 x DP 1.4, 1 x HDMI 1.4	4 x 12G-SDI
	Network Interface		3	3	2 x RJ-45, 2 x SFP+
	USB Port		2	2	2
Power	Power Input		100 ~ 240 V AC	100 ~ 240 V AC	100 ~ 240 V AC
	Power Consumption		350 W	350 W	700 W
Mechanical	Dimensions		370 x 350 x 70 mm/ 14.56 x 13.77 x 2.75 in	370 x 350 x 70 mm/ 14.56 x 13.77 x 2.75 in	438 x 506.20 x 44.20 mm/ 17.24 x 19.92 x 1.74 in

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