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# AdvancedTCA Platforms

- **MicroTCA Platforms**
- Advanced Mezzanine Cards
- CompactPCI Platforms
- Packetarium Platforms
- Network Application Platforms



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Enabling an Intelligent Planet

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# **Networks & Telecom Computing Platforms**

Accelerating Network Platform Evolution











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# About Advantech Networks and Telecom Computing Platforms



Advantech provides mission critical hardware to the world's leading telecom and networking equipment manufacturers. Whether it's wired or wireless nodes at the core or edge of the network, Advantech's products are embedded in the OEM equipment that our world's networking and telecommunications infrastructure depends upon.

Our Blade Computing Division, with an extensive CompactPCI and growing ATCA deployed base, designs both standard and customized products for AdvancedTCA, AdvancedMC and MicroTCA. We team up locally with customers to evaluate project requirements, share design knowledge and develop optimized solutions together. Our Network Application Platform Division shares the same principles, and engineers X86, network processor and FPGA designs into customized tabletop, rackmount and bladed platforms for the world's leading brands in network security.

Advantech's standard commercial off-the-shelf platforms coupled with comprehensive operating system and middleware support provide the foundations for rapid application benchmarking. Proof-of-concept systems can be evaluated quickly, allowing a faster time-to-market for OEM and branded product designs or providing the baseline specification for a customized design. Advantech customization services are designed with customer choice and requirements in mind, allowing our customers to choose the precise level of differentiation 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 nearly 5,000 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 Telecom & Network Computing brochure, Advantech brings together the core competencies of its Blade Computing Solutions and Network Application Platforms. It mirrors the changing market requirements we are observing, where baseline technologies and platform scalability needs converge. The products represented here provide a wide range of platform choices for designers of the next wave of Telecom, Networking and Security appliances as well as those in broader markets where high performance, mission critical attributes are important.

Advantech: designing a world of products and services for fast and secure global communications.

# Advantech Networks & Telecom Ecosystem Alliance Initiative

The ecosystem initiative is focused at each key value-adding step in the integration value-chain:



## Processor and Chip Manufacturers

Major manufacturers of processors, accelerators, switches and network I/O devices



## **Board Manufacturers**

Complementary vendors of PMC's, AdvancedMC's, CompactPCI & ATCA blades as well as PCIe slot cards



## System Infrastructure Manufacturers

Manufacturers of chassis, backplanes, power units and similar system foundation-level components



#### **System Integrators**

Regional and global partners providing integration capabilities of all ecosystem components



## **Operating System Vendors**

Major commercial OS vendors as well as embedded and carrier grade OS vendors



# HA Middleware Designers

Partners providing high availability software suites, interfaces and building blocks



# Networking Stacks & Software Vendors

Developers of networking stacks, tools, suites, codec's and libraries etc



## Application Software Partners

Value-added partners providing turnkey and customizable application suites

## **Becoming an Advantech Ecosystem Partner**

Advantech's Ecosystem Initiative was launched on September 1st, 2009. Participation in the Advantech Ecosystem Partner Program is open to all leading and emerging companies in the industry who want to build value-added joint solutions for customers. Ecosystem partnership is currently focused on three core levels:

(1) Interoperability Testing

(2) Virtual Products – conceptual designs based on a pool of interoperability tested components
(3) Proof-of-concept Systems – turning the virtual designs into real solutions

## **Customer Benefits:**

To ensure functionality of mission critical solutions and reduce development cycle times, Advantech has formed an Ecosystem Alliance Program. It brings together industry leaders and innovators to foster technology teamwork, interoperability testing and solution development.

Proven product interoperability means OEMs can readily integrate tested combinations of hardware and software components with total confidence. In a fast paced market this allows them to test and deliver innovative solutions more rapidly and respond more effectively to emerging customer needs.

At Advantech, participating ecosystem partners collaborate to meet customers' application-specific needs by facilitating the transformation of diverse leading-edge embedded technologies into readily available business solutions Advantech is building an alliance of strategic partners 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.



# **The Convergence in Communications**

#### **IP-based Customer-centric Network Convergence**

Voice, data and video networks are converging around the Internet Protocol. Because telecommunications and IT networks were originally built on separate and disparate technologies with little commonality, it was both complex and costly for service providers to implement new services. But today, with the convergence to an all-IP network, video, like voice, becomes simply another application which can run on a high performance server. Service providers will rely less on fully custom or proprietary hardware to create new service offerings and can create customer value by using software applications to create new services.

## A Common Set of Core Technologies

As new multimedia services drive explosive new revenue growth, the use of open-systems internet-base technologies will dramatically reduce capital and operating costs. In addition the new IP-based applications and services can all employ a common set of core technologies and take full advantage of consolidation in the same way in which UTMs have consolidated multiple workloads onto a single platform in the network security market.

#### Synergy and Scalability

Convergence in the network has stimulated synergy between Advantech's Network Application Platform Division and Blade Computing Division to propose a scalable offering that spans tabletop appliances for small-to-medium businesses, 1U/2U rack mount appliances for medium-to-large enterprise and bladed computing elements for large enterprise, data centers and core networks.

#### **Cost Efficiency**

Whilst our dedicated appliances target customizable, white-box requirements for cost-effective, large volume deployment, our PCle, ATCA, CompactPCI and MicroTCA blades offer a modular, open-standards approach. Cost efficiency is achieved through the reuse of proven core hardware technology across all these product lines whatever the form factor, bringing distinct benefits to customers through economies of scale and portability of software between systems.

## **Design Expertise**

Our Networking OEM customers are extending their reach into larger-scale enterprise, data center and core network space. Advantech's cross-industry expertise in appliances, servers and blade computing elements makes us the ideal technology partner for converged hardware design. Dedicated software development teams provide Board and Linux Support Packages with pre-tested middleware when remote platform management and high availability are key requirements.



# **Telecommunication Solutions**

## **Open Modular Building Blocks**

The telecommunications industry is fundamentally evolving as equipment manufacturers and modular communications platform designers are repositioned along the telecommunications value chain. Advantech provides foundation building blocks for that value chain in the form of standard off-the-shelf computing and management blades designed to meet the needs of Telecom Equipment Manufacturers (TEMs). These building blocks enable our TEM partners to redeploy their resources to focus on differentiated services, such as application development and network management as they themselves evolve into Telecom solutions providers.

#### **Integration and Partnership**

Our Blade Computing Division designs and manufactures blades in AdvancedTCA, AdvancedMC and CompactPCI form factors. We provide solid and timely technology introductions while designing to stringent industry standard requirements such as NEBS and ETSI. From experience, we know how to work hand-in-hand with system integrators and TEMs during the pre-certification phase of their integrated platforms. When standard product adaptation is necessary to meet a TEM partner's design constraint, Advantech understands how to change, move or remove connectors and components, re-adjust for EMC and adjust for chassis-specific cooling issues in a timely manner.

#### Customization

While the AdvancedTCA and MicroTCA ecosystem grows, not all required blade-level functions or elements are available as off-the-shelf products. That's why we invested in geo-regional R&D teams to accompany our TEM partners in design-to-order-services (DTOS). Our DTOS organization offers same time-zone project management for the development of custom or accelerated designs based on our IP design libraries.

#### Strong Ecosystem

As TEMs turn their attention to the higher layers of the value chain to create differentiation, we understand that a strong co-working ecosystem is required to ensure that hardware platforms, operating systems and high-availability middleware components work together. At Advantech we collaborate closely, and partner with, ecosystem hardware and software vendors to ensure interoperability at the earliest possible stage in the design cycle. Board Support Packages and Linux Support Packages are developed both internally and in collaboration with the main industry players. In this way, true time-to-market advantages can be realized.

#### **Economies of Scale**

The shift to modular computing and communications platforms is underway. Advantech is firmly committed to helping the telecommunications industry make a smooth transition to modular platforms, by working closely with the strong worldwide community of hardware developers and software solutions providers. We acknowledge that through partnership and standards, the telecommunications industry can leverage enormous horizontal economies of scale to drive down the overall hardware development costs of the next generation of telecommunications voice and data infrastructure.



Advanced TCA<sup>®</sup> UTCA<sup>®</sup>

CompactPCI® AdvancedMC

# ATCA, AdvancedMC & MicroTCA

Advantech's ATCA integration team unites products engineered by our own hardware and software designers with trusted and tested ecosystem partner building blocks. Our customer focused architects work closely with networking and telecom OEMs to design systems from pre-tested xTCA elements with proven product interoperability. As technology evolves and markets move faster than ever, our integration teams facilitate the delivery of innovative solutions more rapidly to help network equipment OEMS overcome the capacity challenges they are facing and respond more effectively to ever increasing customer demand.

By reducing project risk and complexity at the system level, our customers get to market faster and more affordably, with tested and dependable solutions.



# **xTCA Product Lines**



# AdvancedTCA Design Expertise

ATCA solutions are an extension of Advantech's existing technological expertise. Over the years, we have serviced customers with high-performance industrial-grade computing platforms. With Advantech's new strength in AdvancedTCA dual processor designs, we can help our customers to architect the exact Telecom control and application blades that they desire. Our latest AdvancedTCA CPU boards represent a clear benchmark for our ATCA design capabilities.



## xTCA System Management

Advantech's expertise in system management began with IPMI on CPCI and the adaption of code for Tier-1 accounts. With the advent of MicroTCA, Advantech designed two generations of MCHs with the associated management software and also deploys IPMI on ATCA based on an Advantech codebase. This allows cross-platform re-use and special feature development for OEMs. The IPMI core has been tested against a variety of 3rd party shelf managers and with industry standard compliance test suites.



# Scalability and Processing Density

For applications where processing power needs to be scaled to meet changing application requirements, Advantech's processor blades allow highly dense load balanced clusters to be built up. Our blade families provides densely packed, low power consumption blades with front or rear Etherent and Fabric connectivity. Additional PCIe, SATA and USB options provide a pervasive I/O offering and the foundation for the multi-core evolution.

# MicroTCA & AdvancedTCA Platforms / CompactPCI Platforms

# **CompactPCI Platforms**

# **CompactPCI Platform Solutions**

Advantech continues its commitment to develop, deliver and support the CompactPCI® product line. With over 10-years of experience in CompactPCI blades and system design, we have delivered thousands of products to OEMs across the world. Advantech CompactPCI platforms are widely used in mission-critical industrial and telecommunication applications that demand enhanced reliability, high-availability and serviceability as well as long-term upgradability and manageability.

Advantech CompactPCI blades are designed with the latest Intel® silicon available and offer a comprehensive upgrade path for legacy products as well as a solid base for new designs. Each new blade iteration is designed to facilitate product continuity in industrial and telecom applications by providing simple and economical upgrades which renew and extend the lifecycle of deployed OEM equipment. We continue to diligently select components with guaranteed longevity of supply in order to prolong product lifecycles as long as possible for customers. We follow industry standard quality and revision control processes and offer worldwide RMA services for faster serviceability.

For increased throughput and multi-core scalability, every one of our new SBC designs supports a comprehensive range of Intel® processors, chipsets and controllers, designed for optimum performance and scalability whilst reducing overall power consumption and carbon footprint. Advantech's value-add comes from a broad range of flexible design options on standard product with the ability to customize when it makes the best technological and economical sense for the OEM.

With an emphasis on local expertise and experience, Advantech's support teams and alliance partners offer on-site consultancy to address driver and software compatibility in new designs. In addition, when product modification or customization secures better overall system interoperability or facilitates re-certification needs, Advantech's design teams are available to share their design experience and knowledge of NEBS and similar standards to provide the optimum system solution.

## **CompactPCI Product Lines**



## High Density, Configurable CompactPCI Enclosures

CompactPCI systems are available in 4U rack-mountable enclosures. They offer different front/rear panel I/Os, redundant power supplies, and cooling mechanisms. The systems comply with all PICMG industry standards for CompactPCI, namely packet switching backplane (PICMG 2.16) technology, cPCI hot-swap (PICMG 2.1) capability and H.110 CT Bus (PICMG 2.5) specifications. Rugged design ensures that the enclosures can provide service in the most severe environmental conditions and meet the toughest customer demands.



#### CompactPCI Single Board Computers

Intel-based CompactPCI single board computers are available in many configurations. The boards range from high-performance master CPU boards for mission-critical telecom applications to more all-round processor boards for multipurpose applications. The high-performance 6U CompactPCI board features the latest Intel® multicore processors with exceptional I/O expandability for VGA/LAN/SCSI/ HDD. These boards are designed to meet mission critical requirements for telecom, medical and broader industrial markets.



#### A Variety of CompactPCI Peripherals

Advantech offers a variety of carrier and interface boards for I/O expansion, as well as XMC and PMC modules for adding platform features. We provide a complete range of rear transition boards that interface with our CompactPCI CPU boards, plus power supplies, fan modules and system management controllers to complement the system design.

# **Network Application Platforms**

#### **Meeting Network Security Needs**

Today, network security equipment vendors are confronted with many business and technical challenges in order to differentiate themselves from their competition whilst delivering superior solutions to their customers. To ensure maximum network availability and performance, their enterprise customers require an increasing number of application solutions able to perform packet processing at wire speeds on 10GbE 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 consolidation of new application workloads. To achieve this, network security vendors are investing more and more in application software development and require flexible, scalable and high performance network platforms upon which 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.

#### **Deep Packet Inspection & Network Intelligence**

The same applies to OEMs and system integrators using Deep Packet Inspection (DPI) and Network Intelligence (NI) as an underlying technology for designing new applications. NI builds on the concepts and capabilities of DPI, packet capture and business intelligence. It examines traffic in real time, analyzing IP data packets traversing the network, identifying protocols and extracting packet content and metadata for rapid analysis of data relationships and communications patterns. NI is now a key enabling technology in critical areas of billing and charging, revenue assurance and bandwidth management. The scalability of Advantech's platforms allows suppliers to address these applications and many others like resolving network congestion issues and optimizing network utilization in order to address quality of service issues or improve quality of experience. To meet these application needs, equipment suppliers require hardware platforms able to process packets at greater than wire-speed performance and scale well to respond to changes in port types, counts and increased network bandwidths.

#### Scalability and Performance for Network Throughputs from Mbps to Tbps

Advantech's Network Application platforms provide that scalability and reliability with a range of products scaling from megabits to terabits per second of 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 servers capable of 80 to 160 Gbps of throughput all the way up to multi-bladed ATCA solutions offering scalable performance for data center and telecom network security, where customers need terabits per second of processing performance.

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 first mover advantage and allow them to deploy solutions in volume as soon as production level silicon is available.

# Customization, Design and Integration Capabilities

Starting from standard product lines and form factors, Advantech offers personalized products through a range of integration services. All of our platforms are OEM-Ready with customization and branding options available including chassis colour, logo and front bezel design. More complex system modification services are possible ranging from platform management software adaptation to mechanical or board-level design changes.

Advantech designs for and supplies platforms to many of the leading network security vendors. Our long experience in the Network Application Platform business has helped us to gain a solid understanding of platform needs allowing us to offer professional system integration, compatibility testing and consulting services. Our aim is for our customers to focus on their application development and value added services assured that the hardware platform design and supply is in trusted hands.



Modular, Flexible and Scalable I/O with Network Mezzanine Cards and Wire Speed Packet Processing with Packetarium<sup>™</sup> Network Processing Boards

#### **Network Mezzanine Cards**

Advantech's Network Mezzanine Cards (NMCs) are similar in form factor to AMC's, but are cost-optimized for use in Advantech's high performance x86-based Network Application Platforms and Appliances.

Advantech NMCs deploy best-in-class Intel® Ethernet Controller technology, providing enhanced acceleration features and offload functions with PCIe x8 connectivity for maximum packet throughput. With a wide range of available NMCs for gigabit Ethernet and 10GbE connectivity, the FWA-32XX and the FWA-65XX Network Application Platforms offer multiple Ethernet configurations in a single box to meet the majority of networking application needs.



Advantech is also collaborating with Silicom Ltd to deliver a series of Silicom based NMCs for Advantech's network appliance platforms. Silicom is one of the leading networking NIC card suppliers and provides unique LAN bypass implementations to world class customers. By adding Silicom bypass support for Advantech appliances, customers using Silicom NIC cards on their platforms today can seamlessly migrate to Advantech hardware.

## Packetarium<sup>™</sup> Network Processing Boards

At the high-performance end of Advantech's Packetarium<sup>™</sup> product line, the NCP-7560 integrates up to eight powerful, Network Processing Boards (NPBs) based on processors from Cavium, Broadcom, LSI and Freescale with others under development. NPBs are similar to PCIe slot cards but also provide XAUI connectivity and additional interfaces to connect to a packet switched motherboard, backplane or mid-plane.

A fully configured NCP-7560 packs over 256 cores into a 4U server space to handle network traffic from multiple 10 Gigabit Ethernet and gigabit Ethernet ports. The NCPB-2320 for example is a 32-core Cavium Octeon II Packetarium™ board, with up to 16GB DDR3, routes four XAUI (10GbE) ports to the Packetarium™ NCP-7560 system's main board for high-speed switching. All boards are linked to a Broadcom BCM56820 10 GbE switch on the carrier board which also provides six front panel 10 GbE SFP+ ports and sixteen GbE SFP ports via a Broadcom BCM56512 GbE switch.

Network Processor Boards used in number in the high-end Packetarium<sup>™</sup> systems integrate seamlessly into the 1U Packetarium<sup>™</sup> platforms to facilitate software re-use and allow OEMs to market entry-level variants for cost-sensitive higher volume deployment. These powerful and scalable multi-core building blocks offer the best in multi-10 GigE and GigE packet processing in homogenous or hybrid topologies.



# **Premier Design & Manufacturing Services**

Advantech provides mission critical hardware to the world's leading telecom and networking equipment manufacturers. Whether it's wired or wireless nodes at the core or edge of the network, Advantech's products are embedded in the OEM equipment that our world's networking and telecommunications infrastructure depends upon.



## **Design Services**

- Benefit from leading edge products & IP
- Board and system level
- World class design process including DFM, DFT and DQA
- Optimize time to market at minimum cost & risk



## **Manufacturing Services**

- Tier-1 certified board and system level production
- Full life cycle support & traceability
- Fully owned and cost efficient



## **Customer Support Services**

- Global logistic services & RMA
- Flexible logistic packages
- Tailored & TCO optimized

# **Design Services**

The technology evolution of networking and communication is rapid, innovative, and fast paced. Optimizing product developments by outsourcing hardware platforms and focusing on software value brings further economic benefit. To support clients' success, Advantech shares innovative technology and collaboration product design & development with our clients, who are global leading companies and offer the best equipment in the world's networking and telecommunication industries.

At Advantech we have core technologies in computing architecture. We also have a strong ecosystem network with hardware and software vendors, including chipset, board, chassis, operation system, networking and application layer etc. Advantech NCG focuses on CPCI, ATCA, uTCA & AMC blade computing, and X86 & NPU appliance development. The benefits of our Design Services are: faster time-to-market, cost effective solutions, and global reach with a local touch.



# **Manufacturing Services**

Advantech is located in 18 countries and 39 cities in each major operating region to have a global reach with teams in many geographic regions. We support our service through an extensive global network of offices and an industry-leading eBusiness infrastructure designed to provide responsive service that benefits clients any time, anywhere.

## Manufacturing Capability - We Build It Exactly as You Imagine It

Lean manufacturing is a proven approach to reduce waste and streamline operations. Our expertise and lean manufacturing gives us the ability to design a program that delivers on clients' goals. It also embraces a philosophy of continually increasing the proportion of value-added activity of our business to survive in a global market that demands higher quality, faster delivery and competitive prices. Our manufacturing centers utilize a customer-driven Enterprise Resource Planning (ERP) system to achieve high flexibility and justintime response



## Manufacturing Flexibility - Global Manufacturing & Flexible Capacity

Advantech complements its design strengths with three world-class production centers in China and Taiwan that are fully capable of meeting all of our clients' manufacturing needs and of providing mutual backup to each other. With the full range of product offering available, our production centers can produce a variety of products at either large or smaller volumes as each customer desires. Each center is focused on its production expertise; with this dedication, we're able to deliver products of better quality and with faster delivery time.

## **Quality Assurance Service - Closed Quality Assurance Loop System**

Advantech insists on implementing the most up-to-date standards to ensure quality. We have long incorporated both the ISO 9001 and ISO 14001 standards, the certifications of quality assurance since 1993. The ISO 9001 emphasizes the process model and focuses on continual improvements and customer satisfaction. The ISO 14001 specifies the actual requirements for running an environmental management system. Advantech's Closed Quality Assurance Loop system consists of Design Quality Assurance (DQA), Manufacturing Quality Assurance (MQA) and Customer Quality Assurance (CQA). The system provides constant feedback on design and manufacturing quality as well as reliability and stability of all Advantech products.



# **Customer Support Services**

## **Global Operation Infrastructure and Logistics Network with Local Delivery**

Advantech is located in 18 countries and 39 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.



## **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.

# **ATCA in the Cloud**

#### Introduction

Arguably one of the most discussed and chased after markets within the computing, communications and software industries, cloud computing continues to occupy center stage in the thinking of users, press, analysts and equipment vendors. Although often referenced as "The Cloud," cloud computing represents a broad mix of components and technologies each of which has a crucial role to play. From networking infrastructure to seas of computers and disk servers and a broad set of specialized software, the total market for cloud computing continues to expand rapidly. According to the Yankee group, global revenues for 2010 totaled \$37.8B and by 2015 that will have grown to \$121.1B. SaaS (Software as a Service) continues to represent the lion's share of this growth, and along with the infrastructure of the data center forms the hard center of any fluffy cloud.

Many of the telecom service providers have raised concerns about the "public cloud" with respect to performance, quality of service (QoS) and security and have now defined the "carrier cloud" that addresses these specific issues. With AdvancedTCA technologies and platforms playing a crucial role in the telecom and networking infrastructure they become a natural choice for both carrier and public cloud solutions. The cloud stands for a broad range of applications and services that are available on-demand through the Internet using a largely self-service model. Typically tiered in a pay-for-what-you-use structure, cloud computing services have high levels of elasticity and are dependent on access to large resource pools. From a consumer perspective some of the benefits of cloud computing can be seen as:

- Flexible access access services anytime, from any location and any device
- Access to specialized resources
- Self-service no/minimal IT skills required to implement
- Collaboration multiple users can work on files and documents from wherever (and whenever) they are
- Less expensive No requirement to purchase hardware or software. Most importantly, pay only for what you use.
- Critical IT functions such as backup, security and upgrades etc. are done by the service providers

For a cloud service provider there are numerous challenges that must be met to be able to provide these benefits:

- · Security (data, access) is critical in a heavily virtualized environment
- Scalability on all dimensions of IT (processing power, storage, applications, network) infrastructure systems must economically scale to very high volumes and preferably do so in a granular fashion
- 24x7 availability with high QoS (Quality of Service)
- · Service packaging (productizing) as customers want vertically integrated hardware, software, support solutions
- Effective resource utilization must be able to meet ever changing demand patterns without having to 'over provision' to meet worst case scenarios
- Optimizing of datacenter efficiencies maximizing ROI on CAPEX and OPEX

The architecture of the networking and computing infrastructure becomes critical to managing these challenges. Most implementations are based on standard rackmount servers combined with network switches. A typical rack configuration would have 12 x 2U appliance servers with 2 x 1U switches totaling 26U. Now with Intel® based AdvancedTCA solutions one can achieve the same performance density in a 14U rack space. Using Advantech's MIC-5332 blades, which can be populated with up to 16-cores using two Intel® Xeon® processors per blade, and a 40GE switch and backplane configuration, Equipment Providers are building highly flexible and scalable solutions to match the requirements for the carrier cloud and the next stage in public cloud computing evolution.



## **Advantech ATCA Integration for Cloud Computing Applications**

With the challenges inherent in the rapidly growing cloud computing market where continual upgrades in capacity and performance are required, being able to do more with less space is a huge benefit. Carrier-grade attributes, coupled with the ease of expansion and upgrade offered through ATCA blade additions and swapouts makes cloud computing solutions and AdvancedTCA architectures a natural fit. For high levels of performance, ideal for carrier cloud computing and security applications one should take a good look at the feature set of the Advantech MIC-5332 with Dual Intel® Xeon® processors.

#### MIC-5332 DUAL INTEL® XEON® E5-2600 SERIES PROCESSOR BLADE

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel® Xeon® E5-2600 series. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.

- Two Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Processors
- Intel<sup>®</sup> C600 Series PCH server class chipset with integrated SAS controller
- 8 DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Three 1000BASE-T front panel ports
- One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM

#### Integrated 6-SLOT AC or DC ATCA CHASSIS, 40G Switches and Advantech MIC-5332 Application Blades

Offering the highest available AdvancedTCA performance envelope with network throughput fueled by a 10GbE controller Advantech's Intel® Xeon® E5-2600-based ATCA blades provide the perfect combination of flexibility and performance. When integrated into one of the highly optioned AdvancedTCA chassis with 40GE switches and backplane they create the ideal choice platform for cloud computing applications.





# **Application Delivery Control**

#### Introduction

Depending on where one stands "The Cloud" can look very different. There are numerous definitions and attributes that provide a broad base of features and benefits. Undoubtedly one of the key attributes of cloud computing is elasticity. In this case one can define elasticity as the capability to deploy a network service that can expand and contract as required. Core to being able to deliver on the promise of service elasticity is the construction of an Application Delivery Network or ADN and the implementation of high performance, flexible Application Delivery Controllers.

ADCs are part of the overall market for Application Acceleration Equipment which remains extremely buoyant as Gartner forecasts the next 3 years will continue to see growth of approx 13%, bringing overall spending to \$5.2 billion by 2015. The penetration and growth of the Application Delivery Controller is further evidenced by a mid 2011 report from Dell'Oro Group who see ADC revenues doubling as they outpace the overall Ethernet switch market. The report also underlines the importance of increased network speeds with technologies such as 40GE playing a major role.

Cloud or data center applications can vary greatly from basic website serving to media streaming or storage/backup services. Being able to dynamically allocate server resources is crucial to meeting user demands at the same time as keeping CAPEX and OPEX metrics in bounds. The Application Delivery Controller (ADC) is a network element that sits in front of the pool of application servers and manages a range of network performance related functions. Originally created primarily as a load balancer the ADC now does significantly more. Some of the key functions of the latest ADCs include:

#### • Load Balancing

ADCs implement a variety of load balancing algorithms that maintain parameters such as availability, access and performance to meet specific SLAs (Service Level Agreements).

#### • SSL Acceleration & Offloading

With the aim of squeezing as much performance from application servers as possible ADCs can terminate SSL requests and remove the impact of this security overhead.

#### Traffic Shaping

Going significantly further than traditional load balancing, traffic shaping functions allow for a more intelligent distribution of application specific traffic. Complex rules can be created that route traffic to specific pools of servers based on a multitude of criteria from server location to QoS (Quality of Service) or QoE (Quality of Experience) requirements.

#### • Application Firewalls



Operating in a similar fashion to generic network firewalls but with more detailed information related to specific application traffic an Application Firewall can more easily filter suspicious activity and deny intrusion attempts.

Using technologies such as Deep Packet Inspection, ADCs are able to control application flows with significantly greater granularity than ever before. Such capabilities require platforms that can manage extremely high throughput and operate at 'wire-speed.' With acceleration and performance enhancement as their number one function they must not impede traffic flow in any way. System platforms for ADCs rely on the underlying processing technologies such as those built using the latest high-performance Intel® Processors. The Intel® Xeon® multi-core family has been architected to provide the utmost performance and flexibility required for high throughput applications such as ADCs.

2U rackmount server platforms and AdvancedTCA systems are both ideal architectural choices using a common core technology design for scalability. Advantech provides multiple choices when it comes to matching processing blades and systems to the application specific requirements of an ADC.

## ATCA Blades and Network Application Platforms for Application Delivery Controller (ADC) Integration

#### MIC-5332 DUAL INTEL® XEON® E5-2600 SERIES PROCESSOR BLADE

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel® Xeon® E5-2600 series. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.

- Two Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Processors
- Intel<sup>®</sup> C600 Series PCH server class chipset with integrated SAS controller
- 8 DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Three 1000BASE-T front panel ports
- One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM



Offering the highest available AdvancedTCA performance envelope with network throughput fueled by the latest 10GbE controllers Advantech's Intel® Xeon® E5-2600 based ATCA blade provides the perfect combination of flexibility and performance. When integrated into one of the highly optioned AdvancedTCA chassis with 40GE switches and backplane they create the ideal choice platform for high performance network applications.

#### FWA-6510 INTEL® XEON® E5-2600 SERIES PROCESSOR-BASED 2U NETWORK APPLICATION PLATFORM

Based on Intel®s latest Xeon® processor platform, the FWA-6510 system is designed for maximum performance, scalability and functionality in a 2U rack mount footprint. This multi-core processor-based, high-end network communications appliance is optimized for computing power and high speed, high density I/O with best-in-class energy efficiency. Two E5-2600 series Intel® Xeon® processors (Socket R) with up to 8 cores provide the latest architectural enhancements as well as unprecedented I/O integration: Two Intel® QuickPath Interconnects running at up to 8GT/s each support reduced cross-socket memory I/O latencies and increased throughput. Each socket supports 4 DDR3 channels with speeds up to 1600 MHz for up to 384 GB of ECC memory when using the latest LR DIMM technology. Advanced RAS modes such as mirroring and sparing increase platform reliability. Three I/O controllers per socket provide a total of 80 PCle lanes supporting the latest gen 3 technology of up to 8Gbps per lane.

- 2 x Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 processor
- DDR3 1333/1600 ECC registered memory, up to 384GB
- PCIe gen3 support
- 4 x Network Mezzanine Cards (NMC) slots for a wide range of GbE and 10GbE NMCs with or without bypass
- 1 x PCle x8 full-height/ half-length add-on card
- 4 x 2.5" removable SAS/SATA HDD and SSDs
- IPMI 2.0 compliant Remote Management



The MIC-5332 and FWA-6510 are both available in dual Intel® Xeon® based versions and can be configured with 4, 6 or 8 core processors delivering the ultimate configurable flexibility for Application Delivery Controller platforms.

# Service Edge Node (SEN)

#### Introduction

In its regular Traffic and Market Data report, which provides insights into current trends, Ericsson forecasts a 10-fold increase in mobile data traffic by 2016. According to the report, mobile broadband subscriptions will reach almost 5 billion in 2016, up from the expected 900 million by the end of 2011. That would represent 60 percent year-on-year growth, at the same time as the data consumed by smart phone users is surging. Total smart phone traffic is expected to triple during 2011. Across all devices, internet access will continue to drive mobile traffic development and mobile data traffic is expected to grow by nearly 60 percent per year between 2011 and 2016, mainly driven by video.

As operators look to support broader video services more efficiently, switched broadcast services will play a key role in enabling intelligence at the network edge. They achieve this by implementing a control plane with a control function for video-on-demand services or switched broadcast services whereby the network is queried for availability of the required resources in order to deliver the service type to a subscriber. The network either confirms or refuses the resources to deliver the service, and provisions the network accordingly. This allows operators to distribute content into different areas in the network. An example is where popular content is located on servers in the distribution hub. When high demand content becomes available, like a blockbuster movie, operators could pre-populate servers at the network edge so that more subscribers can access the content consuming fewer network resources and less core bandwidth. This gives operators a more efficient network which can scale with subscriber demand and offer more cost-effective digital video services.



By definition the network edge is where a network of computers process and store data for delivery close to the final destination. Because storage, processing and delivery are done closer to the edge, service reliability and quality is increased overall and local network problems are less likely to have global side effects. The challenge for service providers is how to efficiently scale the network edge and deliver the perfect mobile and video experiences in a competitive world while tightly managing CAPEX and OPEX.

One flexible and scalable approach to resolve these challenges is to deploy networking elements at the network edge based on ATCA blades using only Intel<sup>®</sup> Architecture processors. Today's edge infrastructure is built on multiple technologies making it difficult to power manage and costly to scale, complicating the addition of new

services. Building an edge infrastructure based on one common architecture enables consolidation of services and packet processing workloads onto a single processor architecture, reducing network complexity and simplifying management through common tools, application software and platform consistency.

Together with Intel<sup>®</sup> virtualization technology a single architecture introduces flexibility to handle changing service demand by reprovisioning cores, blades or systems as needed. Videos can be migrated from node to node from the core to the edge, without service interruption, in reaction to changing demand. Performance and energy consumption can be easily scaled based on workload demands. Deploying Advantech's Intel based networking systems at the service edge can also help improve customer QoE while creating potential for new service revenue models. By delivering the highest demand video content from the edge to the consumers, latency and jitter can be reduced which improves the viewing experience an opens up opportunities for differentiated managed services to generate new revenue streams.

## ATCA Blades for Service Edge Node (SEN) Integration

Flexible, telecom-approved processing nodes are key elements required when constructing an SEN platform. Adherence to open standards linked to the availability of the latest and most powerful IA silicon makes AdvancedTCA the ideal architectural choice. Advantech can provide multiple choices when it comes to matching processing blades to the needs of the specific network element. Single or dual Intel<sup>®</sup> Xeon<sup>®</sup> based boards are available such as Advantech's MIC-5322 and MIC-5332 which can be populated with 2, 4, 6 or 8 core processors delivering on the flexibility to create multiple SEN variants.

#### MIC-5322 DUAL INTEL® XEON® 5600 SERIES PROCESSOR BLADE

The MIC-5322 is a dual processor Intel® Xeon® 5500/5600-based ATCA blade. It enables the highest performance available in ATCA form factor with 12-cores and 24-threads of processing power, low DDR3 memory latency, fast PCI Express 2.0 and accelerated virtualization. The Intel® 82599 10 GbE controller plays a key role in end-to-end network performance and throughput, including a 5 Gbps PCI Express 2.0 interface to improve the entire data path as well as multi-core optimized queue support. For fast and secure database applications, the blade supports up to 48 GB of triple channel DDR3 with ECC. The flexibility of the Intel® Xeon® 5500/5600 Series allows tremendous upgradeability, scalability and cost efficiency options with two, four or six-core processors fully supported.

- Two 2, 4 or 6-Core Intel<sup>®</sup> Xeon<sup>®</sup> 5500 or 5600 processors
- Intel<sup>®</sup> 5520 IOH36D/ICH10R server class chipset
- 6 DDR3 VLP DIMMs up to 48 GB with ECC support
- Two XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Two 1000BASE-T front panel ports
- Two USB2.0 front panel ports
- Fully managed, hot swappable RTM



#### MIC-5332 DUAL INTEL® XEON® E5-2600 SERIES PROCESSOR BLADE

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 series processors. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen. 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance

- Two Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Processors
- Intel<sup>®</sup> C600 Series PCH server class chipset with integrated SAS controller
- 8 DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Three 1000BASE-T front panel ports
- One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM



# x86-based Video Transcoding

#### Introduction

As demand for mobile video capacity continues to explode, Advantech platforms, based on 2nd generation Intel® Core™ processor technology, provide transcoding performance and flexibility for system integrators helping mobile operators to offer differentiated video services.

#### Situation

Look around any sports stadium today and you will see thousands of fans cheering for their favorite team on the playing field and a large number of those fans also watching live broadcasts of other games (or matches!) on their smartphones. Just a few years ago, those fans would have been listening to distant games on their radios. Today, they enjoy a high-definition video experience complete with instant replays.

To simply say that the mobile video market is 'rapidly growing' is a huge understatement. It is exploding! The simple sports scenario above is one of many uses, both for work and for fun, which is driving the mobile market down a video-centric path. Cisco's latest Visual Network Index Report shows that over half of today's network data traffic is video and that by 2015, video traffic will be 26 times larger. The estimated number of bytes-per-month is almost impossible to visualize.

#### Challenge

This kind of forecasted market growth represents an exciting opportunity for operators, mobile device manufacturers, network equipment vendors and suppliers. High-value video content will cause consumers to upgrade their devices and pay for premium services. The challenge for mobile operators, simply put, is to maintain quality of service, keep infrastructure costs at a minimum and differentiate their customer's mobile experience.

Industry estimates predict the number of mobile video users will almost double to between 450 and 500 million by 2014, each using their preferred mobile device. Smartphones and tablets come in a wide variety of sizes and each has their own unique capabilities. As both the devices and the delivery networks improve, a flawless mobile video experience tailored to their specific device is now the user's expectation. Anything less leads to unhappy customers who can be very vocal about their experiences and who can quickly move to other devices and carriers.

For the mobile operator, meeting the expectation of delivering a high-quality video experience anytime, anywhere, is complex. From the consumer's perspective, several factors have a huge impact on satisfaction – network access, video delivery equivalent to what they get on their WiFi-connected PCs and premium services. To the operator, from an access and delivery perspective, this translates into the elimination of network edge congestion that would cause a user to have a blocked connection or a dropped call during a cell transition. Delivery of high quality-of-service and premium video services requires high-performance packet processing and transcoding capabilities to accommodate usage levels and to support critical functions and video processing features.



Equipment manufacturers and mobile operators are looking to their suppliers for creative solutions to meet these challenges. They also require development, integration and testing services that will speed their time-to-market of new video capabilities and an upgrade path to future technologies that preserves their investment in new software, continues to add new capabilities and lowers deployment costs.

## Advantech x86-based Platforms for Network Edge Application Development

Advantech platforms based on 2nd generation Intel® Core™ processors are being utilized by several OEMs to develop, prototype and test new edge and Media Gateway (MGW) platforms that will revolutionize mobile media use. These latest processors include hardware features such as H.264 and MPEG2 encoding, decoding and transcoding to accelerate video processing. Typically, this kind of hardware support doubles the media performance with lower power consumption over earlier generations and future generations should continue this rule-of-thumb. This high level of video processing performance enables 'transcoding-on-the-fly,' which is the foundation for new, value-added services.

The ability to transcode, re-format, modify and manipulate video streams at the last possible moment not only allows for the any-input to any-screen-size over any network required by today's users, it allows the operator to develop applications that combine subscriber, network and location information to enhance the user's video experience. Examples include subscriber-specific logo and text overlay, advertisement injection and interactive user applications. Other possible uses might include user proxy applications such as a home energy management service that uses location technology to trigger in-home actions when a consumer passes a specific boundary. For the operator, this also enables on-the-fly bitrate adaptation that minimizes congestion while ensuring the quality of the user's video experience. Today, tier 1 equipment manufacturers are using Intel's 2nd Generation processors, their new development kits and engineering support to speed evaluation, development and prototyping of new, more capable video platforms. One of the development platforms being used is based on the Advantech MIC-5603 illustrates the power and flexibility using Intel solutions to offer advanced media processing capabilities.

The MIC-5603 AMC with the Intel® Core™ i7 processor targets a broad range of applications where network performance, graphics or vector processing and video or other compute intensive tasks are required. The new processor includes Intel® Quick Sync Video Technology which accelerates H264 encoding with built-in hardware and software.

Up to 8 GB of DDR3 1333MHz SDRAM with ECC support, in a dual channel design, makes the MIC-5603 ideal for mission critical applications requiring low latency, reliable memory access. In addition, Advantech's leading-edge, onboard fabric mezzanine interface enhances modularity for a wider range of fat pipes and I/O choice with standard or custom modules. External Ethernet connectivity is via two dedicated GbE front panel ports from the Intel® 6 series chipset and onboard Intel® 82580 quad port LAN controller, which in turn provides two additional GbE ports to the AMC base fabric and one to the Fabric Mezzanine. The Intel® 6 series chipset brings new and enhanced remote management capabilities with KVM over LAN as well as introducing faster I/O than previous generation designs with SATA-III to AMC ports 2-3 and PCIe x4 gen.2 to the gold fingers. An optional fabric mezzanine based Intel® 82599 connects dual 10 GbE to the fat pipes, positioning the AMC for cost effective offload capabilities with best-in-class virtualization and acceleration.

The OEM's initial development platform is built around the MIC-5603 using an ATCA carrier blade capable of accommodating up to 4 AMCs. This allowed for the development and testing of a wide range of GbE and 10 GbE I/ O configurations. In performance testing, each MIC-5603 AMC could process 4 x 1080p transcodes. The maximum configuration used during the development process was based on a 12-slot ATCA chassis with:

- 2 blades providing routing services for packet/flow management, security, classification, DPI media affinity processing
- 4 carrier blades each with 4 Advantech MIC-5603 AMCs. Each carrier blade supports 16 x 1080p transcodes.

Development and initial configuration testing and characterization is in progress prior to short-run field testing in the run up to 2012 roll-out. Another solid use case for workload consolidation on the latest Intel®Architecture.



# **Deep Packet Inspection**

#### Introduction

Deep packet inspection or DPI is now a fast growing application area, both in terms of technology and market size. Performance has increased and costs have been reduced, increasing the potential applications for DPI platforms. It is estimated that the market for DPI within the U.S. Government alone will be worth more than \$7 billion over the next 5 years. The ability to open data streams, inspect their contents and make decisions based on what is found is at the core of DPI. This power to "inspect" is extremely attractive to many of our customers as they consider the variety of decision-based applications that can be layered onto the DPI foundation.

The Internet's original "End-to-End" design concept was to create the most efficient network structure possible and to ship packets around as fast as possible with no heed toward what was being carried. Now, with high processing capacities and specialized ASICs, DPI functionality can be embedded directly into the network. Traffic can be analyzed in real-time as pattern matching algorithms allow specific packet payloads to be recognized. Once a packet is identified, choices can be made based on the application intent. The applications where DPI can make a positive impact are broad ranging. Here are a few examples:

- Security Harmful traffic and malware can be identified and removed.
- Lawful Intercept With increasing VoIP traffic, DPI is needed to isolate specific call flows.
- **Multi-Level Service Provision** Once different styles of content can be identified, a carrier can choose to send different packet streams over different quality and/or speed networks. This has the potential even to be user-or tariff-based.
- **DRM** The entertainment industry has become very interested in DPI as a way to prevent the illegal sharing of copyrighted materials.
- **Content regulation** The use of DPI in order to identify illegal or "undesirable" content continues to stimulate much debate.

Performance is undoubtedly one crucial element of any DPI solution but so is cost, as early solutions were often very expensive. Advantech's NCP-7560 based Packetarium™ product line addresses both aspects and can deliver wire-speed packet processing, providing up to 80 Gbps throughput -- all this at approximately 35% less than an equivalent AdvancedTCA solution.

## **Advantech Deep Packet One Platform**



For developers consolidating workloads on x86-based architectures, Advantech's Deep Packet One platform is a fully configured FWA-6510, with eight 10GbE ports based on the Intel® Xeon® architecture and Intel's Data Plane Developers Kit (DPDK). Platform-tuned acceleration software increases packet processing throughput by up to 10x over a standard Linux port, enabling faster packet movement and processing in Deep Packet Inspection (DPI) applications.

#### NCP-7560 SCALABLE FROM 1 TO 8 MULTI-CORE PACKEtTARIUM™ BOARDS WITH MULTIPLE 10 GBE & GBE PORTS

The NCP-7560 represents the high performance end of Advantech's Packetarium<sup>™</sup> product line. It integrates up to eight powerful, multi-core Packetarium<sup>™</sup> Network Processing Boards for wire-speed packet processing, providing up to 80 Gbps throughput. The main carrier board provides high-speed switched interconnects between boards, along with storage, management and external network connections. Each Network Processing Board is linked by dual XAUI ports to a Broadcom BCM56820 10 GbE switch on the carrier board. The 10 GbE switch also provides six front panel 10 GbE SFP+ports and sixteen GbE SFP ports via a Broadcom GbE switch. An SAS controller connects to two AMC slots for SAS/SATA 2.5" storage.The carrier board incorporates a Freescale MPC8545 local processor for overall switch and system management and provides two front-panel 100 Mbps ports for remote management.

Scalable from 1 to 8 multi-core Packetarium<sup>™</sup> Network Processing Boards using Cavium Octeon<sup>™</sup>, Netlogic XLR, Freescale QorlQ<sup>™</sup> or LSI Axxia<sup>™</sup> Network Computing Processor Boards (NCPBs), the system provides:

- 6 x 10GbE and 16 x 1GbE external interfaces
- 24-port 10GbE switch w/ L2 switch management
- Hot Swappable, 850 W redundant AC or DC power supplies
- SAS/SATA controller for two AMC's with 2.5" storage devices
- Wind River CGL Linux and 6WINDGate<sup>™</sup> support
- Designed for NEBS



#### FWA-6510 AND DEEP PACKET ONE EVALUATION PLATFORM

Based on Intel®s latest Xeon® processor platform, the FWA-6510 system has been designed for maximum performance, scalability and functionality in a 2U rackmount footprint. This multi-core processor-based, high-end network communication appliance is optimized for computing power and high speed / high density I/O with best in class energy efficiency. Two E5 series Intel® Xeon® processors (Socket R) with up to 8 cores each provide the latest architectural enhancements as well as unprecedented I/O integration over previous generation CPUs. Advantech's Deep Packet One Evaluation Platform, enhanced with the Intel® Data Plane Development Kit's (Intel® DPDK) optimized libraries, enables fast packet processing in the data plane using multi-core Intel® architecture technology. This latest platform makes it possible to consolidate packet, application and control processing workloads on a single Intel® architecture platform. Enabled by leading-edge packet processing and network intelligence software from our growing DPI ecosystem, Deep Packet One is an optimized development platform enabling fast-track evaluation of the latest silicon technologies from Intel. The platform can be expanded with a wide range of Network Module offerings allow many port configurations with or without network bypass, offload and acceleration.

- 1 x FWA-6510-00E 2U Intel DPDK-enabled appliance
- 2 x Intel<sup>®</sup> Xeon<sup>®</sup> E5-2648L
- 32GB DDR3
- 1 x 160GB 2.5" SATA HDD
- 4 x Dual 10GbE NMCs (Niantic)
- 8 x SFP+ Modules

Software support from 6WIND for 6WINDGate<sup>™</sup> and Qosmos for iXEngine<sup>™</sup>



# **P2P Traffic Management**

#### Introduction

When Napster first appeared nobody knew the effect it would have on network traffic. Popularized by its music sharing ability, Napster epitomized a new breed of file sharing systems known as peer-to-peer or more commonly referred to as P2P. While the exact fraction of Internet traffic consumed by P2P has been much debated (one oft-quoted claim was "greater than 60%"), it is undeniably large. According to a forecasting study conducted by Cisco, although P2P is declining as a percentage of overall IP traffic, it continues to grow in volume. The study estimates that "P2P file-sharing networks are now carrying 3.3 exabytes per month and will continue to grow at a moderate pace with a CAGR of 18 percent from 2008 to 2013."

Whatever the actual percentage, the challenge is that this P2P traffic is disproportionate and not revenue generating. Efforts to limit bandwidth based on TCP port numbers are now often sidestepped so a more discriminating strategy is required. Utilizing DPI (Deep Packet Inspection) techniques it is now possible to build an application platform that can identify and isolate specific P2P traffic, e.g., BitTorrent. Once identified, rules can be applied to control traffic based on a variety of variables. For example:

- Traffic type
- Specific User (IP)
- Specific Application (by user) e.g. P2P vs. HTML, VoIP etc.
- Traffic flow (direction)
- Tariff or rate class by user and/or traffic type

In this way the P2P traffic may be throttled or diverted and priority given to more "sensitive" applications. Traffic management platforms have existed for some time although they were near totally proprietary and based on custom configured hardware. There were no "open" interfaces and one was tied to a single major manufacturer. The reliance on a single supplier kept costs high, both for the development of new traffic software and the systems themselves.

The flexibility of an open customizable platform enables application developers to create software for a broader market and customer base. An environment where new traffic modules (both hardware and software) can be added easily, facilitates reuse and keeps costs under control. Advantech offers such a system platform that delivers maximum benefit for the software developer as well as the network OEM. The NCP-5260, based on a dual Intel® Xeon® 5600 Series motherboard, is connected to two Netlogic XLR Network Processor Boards performing deep packet processing on multiple 10GbE ports prior to forwarding packets to the Intel® Xeon® processors. This hybrid design has numerous performance advantages where standard x86 software can be implemented on the motherboard and packet processing offloaded to the NPU's. Advantech's NCP-5260 is a clear choice for such demanding traffic management applications.



#### NCP-5260 for P2P Traffic Management

The NCP-5260 represents a new generation of hybrid system designs with Intel® architecture processing on the control plane, and Packetarium<sup>™</sup> network processing boards for the data plane. It integrates up to two powerful, multi-core Packetarium<sup>™</sup> network processing boards for wire-speed packet processing and accommodates up to 16 x 10 GbE external interfaces. The main carrier board provides the high-speed switched interconnects between Packetarium boards. The Intel® Xeon-based server board provides storage, system-management and remote management network connections.

Each network processing board is linked by dual or quad XAUI ports to a Broadcom 10 GbE switch on the carrier board. The 10 GbE switch provides sixteen front panel 10 GbE SFP+ ports. The carrier board incorporates a MPC8545 processor for overall switch management.

A SATA controller on the server board connects to two 2.5" SATA HDD slots.

The scalability of the NCP-5260 positions it ideally for OEMs designing high bandwidth systems in enterprise networking. It is particularly applicable for applications in service-provider networks for enhanced security, in content-aware routing and subscriber-based services.

The initial Packetarium<sup>™</sup> network processing boards supported by the NCP-5260 are based on the Netlogic RMI XLR 732 8-core processor. Each processor supports up to 4 GB of memory on two DIMM sockets. Two PCIe x4 provide control plane connectivity with the carrier while two XAUI ports connect to the data plane. The board is designed with IPMI 2.0 H/W management, remotely managed via a local Module Management Controller (MMC) connected to the carrier's IPMB-L (I2C) bus. A console port and a 1000 Mbps port provide further management interface options. Other network processing boards in the Packetarium<sup>™</sup> family are also compatible with NCP-5260.

- Packetarium<sup>™</sup> Network Processing Board design
- Hybrid design for Intel® architecture on control plane, and Packetarium Board as data plane
- 6WINDGate software support provides accelerated Fastpath packet processing offload without changes to legacy x86 code. Up to 7x more performance over the standard Linux network stack.
- 1 to 2 Packetarium<sup>™</sup> Board slots
- Dual Intel<sup>®</sup> Xeon<sup>®</sup> 5500/5600 series support
- 16 x 10 GbE external interfaces
- 10 GbE switch w/ L2 switch management
- One standard PCIe expansion slot
- IPMI 2.0 HW Management
- Linux support
- FIPS Level 2 compliant



"Advantech's NCP-5260 Packetarium™ design is a clear choice for demanding traffic management applications requiring accelerated packet processing and Intel® server class data processing."

# **Media Gateway**

#### Introduction

Today when we say "network" it is synonymous with IP or the packet network that we now take for granted has usurped the long-established circuit switched telephone network. Those circuits, however, still exist and the network element that enabled such a change still has an ever evolving and crucial role to play – the media gateway. This critical interworking element translates between networks of differing standards. It provides conversion of streamed media formats such as voice or video, and manages any associated signaling. The gateway is a fundamental application whose core architecture has changed little and is expected to contribute (along with its partner – the softswitch) nearly \$8.5 billion to the overall telecom equipment market.

The IETF established the original definition and functional split between the Media Gateway (MGW), which handles the bearer paths, and the Media Gateway Controller (MGC or Softswitch). This reduced costs and the complexity of endpoints. The MGC provides the intelligence, enabling centralized call flow, while the Media Gateway (MGW) becomes an efficient routing device. The main task of a Media Gateway is to convert between the digitized telephony signals found on traditional telephone network, and the stream of data packets on the packet network.

Any Media Gateway platform must support:

- **Encoding/Decoding** The core media conversion functions require a multitude of CODECs that enable support of fixed, mobile and cable applications.
- Echo Cancellation Echo and duplex problems can be a major source of perceived quality issues with users, therefore EC is one of the most critical functions, as differing networks exhibit wide variations in delay/latency.
- Fax Support Provides the ability for the packet network to appear transparent to conventional analogue fax machines.
- Flexible channel densities Cost per port across different mixes of CODECs is a crucial metric, thus it is advantageous for a single platform architecture to be capable of supporting varying densities.

The ability for a media gateway to handle multiple media types is fundamental. Being able to handle numerous conversions simultaneously across a large number of lines requires high performance, high density DSP (Digital Signal Processors) farms. AdvancedTCA® provides the ideal architecture to enable the appropriate connectivity as well as the infrastructure to support high density DSP blades such as Advantech's DSPA-8901 Blade. In combination with a processing blade powered by the dual Intel® Xeon® MIC-5332, Advantech has all the ingredients needed for OEMs to build leading edge multifunction media gateways.



## Advantech ATCA Blades for Media Gateway Designs

#### MIC-5332 DUAL INTEL® XEON® E5-2600 SERIES PROCESSOR BLADE

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel® Xeon® E5-2600 series processors. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen. 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.

- Two Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Processors
- Intel® C600 Series PCH server class chipset with integrated SAS controller
- 8 DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Three 1000BASE-T front panel ports
- One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM

#### DSPA-8901 ATCA BLADE WITH 20 TEXAS INSTRUMENTS TMS320TCI6608 DSPs

With its twenty onboard TMS320TCI6608 DSPs at 1.0 GHz core frequency, the DSPA-8901 provides 160 cores of processing power to reach the higher levels of performance density needed to build the highest capacity wireless media gateways. The DSPA-8901 significantly reduces overall system power dissipation and system cost, and frees up valuable slots in gateway elements for additional subscriber capacity and throughput. The DSPA-8901 includes a high-performance Freescale QorlQ P2020 processor. The powerful Broadcom BCM56321 switch terminates the 10 gigabit Ethernet fabric connections and distributes traffic to the twenty DSPs. The DSPA-8901 offers unrivaled packet and media processing capabilities. For increasing demand in high end video conferencing, broadcasting and telepresence fields, the DSPA-8901 ATCA blade also offers unrivaled image processing performance for compression and decompression, image analysis, filtering and format conversion.

- 20 Texas Instruments TMS320TCI6608 DSPs
- 512 MB DDR3 memory per DSP
- BCM56321 10 GbE switch for both Fabric Interface and Base Interface
- Freescale QorIQ<sup>™</sup> P2020 for Local Management Processor (LMP)
- IDT Tsi577 Serial RapidIO switches
- Pigeon Point System IPMI 2.0
- Wind River Linux PNE-LE 4.0 support for P2020
- Single slot PICMG 3.0/ 3.1 compliant



"The combination of the MIC-5322 and DSP ATCA Blade creates an unrivaled partnership of high performance computing and high density DSPs, making them the ideal platform for VoIP or Video Media Gateways."

# **SIP Application Servers**

#### Introduction

Technology, architecture, computing performance, and bandwidth—all these elements continue to advance; on their own however, they are simply enablers, enablers of applications. The all-IP network as defined by 3GPP's IMS (IP Multimedia Subsystem) architecture has created the ultimate enabling environment, in which the ultimate enabler is the SIP Application Server. The IMS market continues to grow, fueled by ongoing VoIP, LTE and other enhanced mobile service deployments. Service provider spending on IMS related infrastructure is forecast to reach nearly \$4.5 billion over the next 5 years (Infonetics Research), and SIP Application Servers will be a healthy chunk of that spend.

The concept of the SIP Application Server is elegant in the way in which it provides a highly flexible and seamless construct, allowing for new value-added services to be implemented quickly and easily. One key element in this "seamlessness" is the ability for a SIP Application Server to bridge multiple environments. One could happily be at home working (or interworking) with legacy TDM and IN (Intelligent Network), transitional NGN or fully fledged IMS networks.

While the ability to bridge and transition from pre IMS solutions is crucial, future potential revenue generating applications are the primary attraction of the SIP Application Server. Application development and implementation is solidly grounded in the Java and Web 2.0 environments, enabling the ability to create interactive web and smart phone communications applications; examples could be "click-to-call or click-to-dial." When linked with media capabilities, whether implemented directly inside the SIP Application server or provided by an adjunct Media Server, the potential applications are almost without bounds.

- TDM-VoIP Gateway
- IP Media Server
- Voice/Video IVR
- Automated Collect Calling
- Mobile IP Conferencing
- Consumer VoIP and IM
- Mobile Multi-party Video Sharing
- Remote TV/PVR Manager
- Unified Voice/Video Messaging
- Prepaid Voice/Video Calling Cards



The broad range of potential applications that may be provided by a SIP Application Server makes platform flexibility and configurability critical. AdvancedTCA, therefore, represents the perfect system platform architecture. With the ability to mix and match raw processing performance with media capabilities and network bandwidth options, Advantech's product line is unmatched. Compute performance and flexibility is at the core of all SIP Application Servers. Offering the highest available AdvancedTCA performance envelope, network throughput fueled by a 10GbE controller and database performance assured through the 256GB of triple channel DDR3, Advantech's Intel® Xeon® E5-2600 based ATCA blades are the perfect choice for your SIP Application Server.

# 16 and 12-Core Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 / 5600 Series ATCA Blades for SIP Application Server Design

#### MIC-5332 DUAL INTEL® XEON® E5-2600 SERIES PROCESSOR BLADE

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel® Xeon® E5-2600 series processors. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen. 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.



- Two Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Processors
- Intel C600 Series PCH server class chipset with integrated SAS controller
- 8 DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Three 1000BASE-T front panel ports
- One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM

#### MIC-5322 DUAL INTEL® XEON® 5600 SERIES PROCESSOR BLADE

The MIC-5322 is a dual processor Intel® Xeon® 5500/5600-based ATCA blade. It enables cost-effective, high performance processing with 12-cores and 24-threads of processing power, low DDR3 memory latency, fast PCI Express 2.0 and accelerated virtualization. The Intel 82599 10 GbE controller plays a key role in end-to-end network performance and throughput, including a 5 Gbps PCI Express 2.0 interface to improve the entire data path as well as multi-core optimized queue support. For fast and secure database applications, the blade supports up to 48 GB of triple channel DDR3 with ECC. The flexibility of the Intel® Xeon® 5500/5600 Series allows tremendous upgradeability, scalability and cost efficiency options with two, four or six-core processors fully supported.

- Two 2, 4 or 6-Core Intel® Xeon® 5500 or 5600 processors
- Intel<sup>®</sup> 5520 IOH36D/ICH10R server class chipset
- 6 DDR3 VLP DIMMs up to 48 GB with ECC support
- Two XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Two 1000BASE-T front panel ports
- Two USB2.0 front panel ports
- Fully managed, hot swappable RTM



"Offering the highest available AdvancedTCA performance envelope, network throughput fueled by a 10GbE controller, and database performance assured through the 256GB of triple channel DDR3, Advantech's Intel® Xeon® E5-2600 based ATCA blades are the perfect choice for your SIP Application Server."

# **Video Transcoding with DSP**

#### Introduction

The moving image has become a foundational element in today's culture. No longer restricted to our family room TVs, video is now ever-present and far from its original analogue roots. With broadcast digital TV, HD, internet video & TV and of course video-enabled Smartphones, things have come a long way in a very short time.

What may have been thought of as a "fad" only a few short years ago, (who wanted to watch video on the then tiny cellphone screens?) has turned into an explosive growth scenario. Apple kicked things off with the iPhone, but Microsoft and Blackberry quickly kicked up the pace, and then of course there is Google as it seems hardly a day goes by without a new Android-based smartphone hitting the streets. The bottom line is a huge growth surge in video usage across a wide variety of platforms, from cellphones to computers and of course large HD TVs, with 3D just around the corner.

This has caused many challenges for those hosting and/or "broadcasting" the video content. With such a broad spectrum of devices and delivery mediums and their associated bandwidth restrictions a single video file must maintain quality even though delivery to a phone would be at lower bit rate and resolution than the same file intended for HD broadcast over a dedicated cable connection. The need to be able to support multiple formats, compression and encoding schemes has generated the market for Video Transcoding which analysts estimate will be in excess of \$1.5 billion by 2014.



Multi-format transcoding enables the use of single source video content that can be manipulated (even "on the fly") and the format, bitrate and/or resolution be changed so that it may be viewed on any video capable device. DSP and high performance computing technology is a prerequisite for these types of demanding applications.

Advantech understands these complex issues and alongside their technology partners such as TI, have developed a product range and architecture that can handle the needs of today, and will grow as demands increase and new platforms are integrated.

## **Advantech Multimedia Processing Cards**

#### DSPC-8681 / DSPC-8682

#### 4 / 8 TI TMS320C6678 DSP ON HALF-LENGTH AND FULL-LENGTH PCI EXPRESS CARDS

The DSPC-8681 and DSPC-8682 are built upon 4 and 8 multi-core TSM320C6678 DSP devices from Texas Instruments respectively, with high-speed inter-DSP communications and high-bandwidth interconnection to the host. The half-length DSPC-8681 and full-length DSPC-8682 are able to perform at 1,024 and 2,048 GMAC (Giga Multiply-Accumulation operations per second) respectively, using the embedded C66x DSP cores inside the TMS320C6678 devices. This unrivaled raw computing power makes the DSPC-8681 and DSPC-8682 a perfect fit for advanced and complex video processing such as JPEG2000 for 2K/4K processing, AVC-Intra 50/100 and AVC-Ultra, deep-color pixel manipulation, HEVC/H.265 and motion-compensated temporal filtering whose visual effects rely heavily on the underlying hardware performance to fulfill new features never seen before.

## **Multimedia Processing Cards**

#### DSPC-8682

Full-length PCI Express Card with 8TMS320C6678 DSPs

#### DSPC-8681

Half-length PCI Express Card with 4TMS320C6678 DSPs



#### **Applications**

- IPTV/Web TV/mobile TV video transcoder
- Audio and video transcoding/transrating
- Media gateways and accelerators
- Medical applications
- High Performance Computing
- Broadcasting Application
- Automatic Optical Inspection

# **Session Border Controllers**

#### Introduction

With the advent of VoIP came a host of network opportunities and challenges. One such challenge related to NAT (Network Address Translation) as the borders between networks, private and public or inter-carrier were traversed. Various network devices and techniques evolved to solve these NAT traversal issues; one however, took the lead and now has become ubiquitous, offering a variety of functions – the Session Border Controller or SBC. Demand for SBCs remains strong and continues to grow within the service provider and enterprise markets which combined represent a global market worth in excess of \$1.6 billion over the next 4 years (Infonetics Research).

A Session Border Controller does exactly what is says: it controls the data streams and sessions (in the VoIP case sessions represent calls) as they traverse the border or interconnection point between two networks. The border point of control can be in the enterprise e.g. where a corporate network enters the public Internet or at an interconnect between two service providers. In either case the SBC provides a variety of functions for its host network.

Securing and connecting the network – Network Address Translation (NAT) is performed and firewall functions may be implemented in conjunction with other firewall devices. VoIP signaling is enabled and corrected as necessary. The border is policed and protected from potential Denial of Service or other attacks. Ultimately the SBC says who gets in and who doesn't.



- Quality of service An SBC can act as a load sensing and balancing router and becomes a key component of the network's QoS policy.
- Management & Statistics As all network traffic must flow through an SBC it's a great place to collect statistics, billing and other management information.
- Regulatory compliance SBCs must allow for lawful interception and monitoring of calls and have the ability to prioritize emergency calls.

Flexibility, connectivity and performance are all required for the ideal Session Border Control platform. The Advantech product line provides all these elements. Long term experience and relationships with the major processor and NPU vendors ensure that Advantech offerings always provide for the latest technology and can demonstrate clear upgrade paths. The FWA-3210 is an excellent example of an OEM application ready platform. Available with up to 8 Gigabit Ethernet ports and considerable expansion options along with a choice of the latest Intel® embedded and commercial processors the FWA-3210 is ideally geared towards the needs of the SBC OEM. The FWA-6510 based on dual Intel® Xeon® E5-2600 processors with up to 8 cores positions it well for more demanding performance and 10GbE connectivity.

## Advantech OEM-Ready Appliances with Intel<sup>®</sup> Xeon<sup>®</sup> processors for Session Border Control

#### FWA-3210 1U INTEL®XEON® E3-1200 SERIES NETWORK APPLICATION PLATFORM

The FWA-3210 1U appliance can be configured with a range of Intel® processors, Ethernet ports, PCIe I/O options and Advantech's Network Mezzanine Cards (NMCs) to create costeffective platforms for specific enterprise networking applications. The Appliance is powered by processors utilizing the LGA-1155 socket, including the Intel® Xeon® E3-1225/1275, 2nd generation Intel® Core™ i7-2600/ i3-2120, the Pentium®-G850 and the Celeron®-G540 Processor. Memory configurations can include 4 x DDR3 1333/1066 DIMMs for up to 32GB in total. In the base configuration, the system comes with a single internal 2.5" SATA HDD bay, 6 Intel® 82574L GbE controllers, and one PCIe x8 expansion slot.

- Supports Intel® Xeon® E3-1225/E3-1275 (FWA-3210A) and 2nd generation Core™ i7-2600/i5-2400(FWA-3210B) and i3-2120 / Pentium®-G850 / Celeron®-G540 Processors
- Supports 4 x DDR3 Un-buffered 1066/1333 DIMMs, up to 32 GB (FWA-3210A); 2x DDR3 Un-buffered 1066/1333 DIMMs, up to 16 GB (FWA-3210B)
- 6 x 10/100/1000 Mbps LAN on Board with up to 3 bypass segments
- 1 x 3.5" or 1 x 2.5" SATA HDD / SSD
- 2 x Advantech Network Mezzanine Cards (NMCs)



System features include an LCM, RJ45 console, and 2 USB ports. IPMI LOM management support is optional. Additional I/O and processor offload capacity is provided by support for two network mezzanine card modules. The FWA-3210 is 1U Network Appliance targeted at CPU-intensive applications such as high-end Unified Threat Management (UTM) and applications with large I/O bandwidth requirements such as quality and service control or content filtering and management.

#### FWA-6510 2U INTEL®XEON® E5-2600 SERIES NETWORK APPLICATION PLATFORM

Based on Intel®s latest Xeon® processor platform, the FWA-6510 system is designed for maximum performance, scalability and functionality in a 2U rack mount footprint. This multi-core processor-based, high-end network communications appliance is optimized for computing power and high speed, high density I/O with best-in-class energy efficiency. Two E5-2600 series Intel® Xeon® processors (Socket R) with up to 8 cores provide the latest architectural enhancements as well as unprecedented I/O integration: Two Intel® QuickPath Interconnects running at up to 8GT/s each support reduced cross-socket memory I/O latencies and increased throughput. Each socket supports 4 DDR3 channels with speeds up to 1600 MHz for up to 384 GB of ECC memory when using the latest LR DIMM technology. Advanced RAS modes such as mirroring and sparing increase platform reliability. Three I/O controllers per socket provide a total of 80 PCIe lanes supporting the latest gen 3 technology of up to 8Gbps per lane.

- 2 x Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 processors
- DDR3 1333/1600 ECC registered memory, up to 384GB
- PCle gen3 support
- 4 x Network Mezzanine Cards (NMC) slots for a wide range of GbE and 10GbE NMCs with or without bypass
- 1 x PCIe x8 full-height/ half-length add-on card
- 4 x 2.5" removable SAS/SATA HDD and SSDs
- IPMI 2.0-compliant Remote Management



With this improved I/O connectivity, the FWA-6510 can support up to 4 Network Mezzanine Cards (NMCs) for modular, configurable networking I/O and acceleration. PCIe gen 3 technology paves the way for supporting 40GbE and quad 10GbE modules in the near future and up to 8 NMC slots. The Intel® C600 Series PCH (chipset) not only integrates standard platform I/O and peripherals, but also supports an integrated SAS controller for the most reliable, highest speed mass storage. Up to four front-loadable 2.5" SAS/SATA hard disks or solid state drives are supported.

# **SDR Base Station Control**

#### Introduction

Although building out a mobile cellular network has never been exactly "simple," the complexities faced by today's mobile providers are truly multifaceted. When considering network design, especially in the RAN (Radio Access Network), one must balance performance, capacity and economics. The "old school" methodologies of creating "single purpose" base station configurations that require discrete hardware and support limited wireless standards and frequencies etc. make changes and upgrades costly and time consuming. Through the utilization of SDR (Software Defined Radio) technologies, one can establish a single flexible platform and make any necessary changes without ever having to deploy an engineer.

Although there is significant wireless infrastructure deployed, with changing and evolving standards/architectures (e.g., LTE) there is plenty more to come. The global market for RAN equipment remains buoyant with 2009 revenues in excess of \$38 billion. Continued growth is forecast over the next 5 years with mobile infrastructure revenues expected to be in the region of \$42 billion by 2014 (Dell'Oro Group).

As a software solution, SDR products do not need specialized hardware and can be implemented using COTS (commercial, off the shelf) computing platforms. As such, the combination of COTS platforms and SDR for base station and other RAN configurations deliver significant benefits for mobile operators.

**Improved Economics and ROI** – COTS platforms utilizing GPPs (general purpose processors) reflect more commoditized pricing. Footprints are smaller and fewer site visits combine for cost savings.

**Radio upgrades/changes** – Frequency changes and/or upgrades to new wireless standards would previously have required fundamental hardware changes. With

SDR these changes and feature enhancements can be made easily and remotely.

**Flexible Capacity** – Overall performance is a function of the processor/software combination, therefore new processor introductions and associated software may be implemented simply and economically.

With SDR replacing previously specialized hardware designs with their multitude of ASICs, DSPs, and FPGAs, general purpose processors are able to manage all the requirements of Base Station Control.

Marrying 12-slot capacity in a 4U footprint with high performance Intel® Core™2 Duo processors, Advantech designed a cost-optimized ODM platform suitable for high capacity, cost-sensitive base station applications.

The system was selected by Cambridge, Massachusettsbased Vanu® Inc. as the platform for their SDR-based Anywave base station. Advantech's custom design experience and reputation linked to the flexibility, capacity and performance of MicroTCA platforms provide best-in-class solutions for base station and other RAN applications.


# Software Defined Radio on Intel<sup>®</sup> Processor AMCs Provides Flexible Base Station Control with Custom-designed Chassis

#### START WITH A COST-OPTIMIZED MICROTCA SYSTEM CUSTOMIZED TO MEET YOUR NEEDS

To meet the cost constraints and render SDR on general purpose processors viable with MicroTCA, Advantech designed a 4U chassis from scratch for this Base Station Controller project. The chassis was engineered to support bottom-to-top cooling for environments which required it, and adopted a special air duct scheme which can be fitted to the top and bottom of the chassis to provide front-to-rear cooling. The ducts were designed in such a way that if multiple chassis are stacked, only 1U additional height is required per chassis. This provides what is termed a lossless stacking configuration and allows up to 40W cooling per slot, which is sufficient for current generation Intel® Core2 Duo processor AMCs as well as next-generation processors.

The power supplies were relocated from the front of the chassis to the rear and the depth was slightly extended to cater for that. This allows for two MCHs and twelve PrAMCs to be accessible from the front. In the case of SDR, this is particularly significant as twelve slots allow three PrAMCs per cellular standard with three PrAMCs required to cover three sectors. To provide adequate processing performance whilst meeting the power dissipation constraints, all 12 slots were configured and tested with low voltage Intel® Core™2 Duo SKUs. In this particular case, the backplane went cost down to support dual-dual star GbE and remove fat pipe switching in order to reduce the layer count on the backplane to 10 layers and simplify the MicroTCA Carrier Hub (MCH) design.



# INTEGRATE UP TO 12 SECOND-GENERATION INTEL<sup>®</sup> CORE<sup>™</sup> i5 or i7 PROCESSOR AMCS

Advantech's Dual Core PrAMCs provide exceptional levels of scalability for software-designed hardware functions such as Radio or Host Media Processing. They provide the building blocks for unprecedented levels of reliability, performance and power savings. The MIC-5602Rev2 PrAMC supports Intel® Core™ 2 Duo Low Voltage processor with up to 4GB memory.

The MIC-5603 supports Intel® Core™ i5 or i7 Processors with up to 8GB four GbE ports to the AMC base fabric and one to the Fabric Mezzanine. The Intel® 6 series chipset brings KVM over LAN and faster I/O with SATA-III and PCIe gen.2. An optional fabric mezzanine based Intel® 82599 connects dual 10 GbE to the fat pipes, positioning the AMC for cost effective offload capabilities with best-inclass virtualization and acceleration.



# **Network Acceleration**

#### Introduction

Current market reports and news articles from around the world all seem to be in agreement that mobile broadband usage is now growing faster than wireline. The latest smartphones connected to fast 3G networks provide compelling applications for users and are stimulating a dramatic uptake in the use of mobile-broadband technology. The mass-market adoption of wireless data continues to be spurred by network operators, as they introduce innovative new data services.

Many subscribers are now opting for fixed mobile substitution and are switching to mobile as their only form of connectivity. New portable devices such as smartbooks, netbooks and other internet devices are increasingly web-centric, demanding continuous connectivity and downloading additional image data to fill their larger screens. Furthermore, mobile video streaming is in growing demand while "on the go" web browsing and document downloads are increasing to rates which may soon be mirroring that of wireline broadband.

One major problem faced now by network operators is the probable lack of wireless network capacity to address the rising demand. As the amount of spectrum available for broadband services is limited and as wireless networks inherently have far lower capacity than wireline networks, many users are beginning to witness the effects of network congestion, complaining more frequently of slow network operation. The bottom line is, unless something is done soon, a finite number of mobile users with bandwidth-intensive applications will most likely consume all the available wireless network capacity.

#### **The Solution**

Fortunately there are several ways in which operators can manage capacity issues, some of which will take more time than others to implement. These include offloading data onto other networks, more restrictive pricing plans, new spectrum use, and deployment of new technologies. One method available now for rapid deployment has been successfully implemented by ActivNetworks, a company specialized in the acceleration and compression of http streams for web traffic optimization.

ActivNetwork's BoostEdge products accelerate and secure web applications. BoostEdge is hot pluggable and can be installed non-intrusively in less than two hours, without any modification to the operator's network nor applications, servers or end-user mobile devices. In most customer-tested cases, web data traffic is immediately cut by six-fold and response time is improved by three. In addition, BoostEdge ensures high server availability and improves load handling.





BoostEdge is essentially an application that speeds up response times, economizes bandwidth and secures web applications. It also helps optimize 3G mobile networks for telecom operators. Its patented "Plug'n Activ" technology allows rapid implementation, without infrastructure changes, and without service interruption, unlike the commonly used proxy mode.

BoostEdge comes in two product lines: the first optimizes the mobile flow (3G) and the second accelerates and secures web applications (Application Delivery Controller). BoostEdge is already accelerating business applications at over 30% of CAC 40 companies as well as large e-commerce sites, banks, insurance and institutional online portals.

ActivNetworks chose Advantech's NCP-7560 Packetarium system for its ability to cost-effectively scale up to 80 Gbps of packet handling in 4U of server rack mount space. The modularity of the system accepts up to eight multicore network processor boards with over 100 cores handling core network traffic on multiple 10 gigabit and gigabit Ethernet ports.

# 80 Gbps Throughput Scalable to 128 network processor cores Multiple 10 GbE and GbE ports

The NCP-7560 represents the high performance end of Advantech's Packetarium<sup>™</sup> product line. It integrates up to eight powerful, multi-core Packetarium<sup>™</sup> Network Processing Boards for wire speed packet processing providing up to 80 Gbps throughput. The main carrier board provides high-speed switched interconnects between boards, along with storage, management and external network connections. Each Network Processing Board is linked by dual XAUI ports to a Broadcom BCM56820 10 GbE switch on the carrier board. The 10 GbE switch also provides six front-panel 10 GbE SFP+ ports and sixteen GbE SFP ports via a Broadcom GbE switch. A SAS controller connects to two AMC slots for SAS/SATA 2.5" storage. The carrier board incorporates a Freescale MPC8545 local processor for overall switch and system management, and provides two front-panel 100 Mbps ports for remote management.

#### NCP-7560

- Scalable from 1 to 8 multi-core Packetarium<sup>™</sup> Network Processing Boards
- Cavium Octeon<sup>™</sup> Plus
- Netlogic XLR<sup>®</sup>
- Freescale QorlQ<sup>™</sup>
- 6 x 10GbE and 16 x 1GbE external interfaces
- 24-port 10GbE switch w/ L2 switch management
- Hot Swappable, 850 W redundant AC or DC power supplies
- SAS/SATA controller for two AMC's with 2.5" storage devices
- Wind River CGL Linux and 6WINDGate<sup>™</sup> support
- Designed for NEBS 3.0

# 

#### ACTIVNETWORKS BOOST EDGE-DEPLOYMENT EXAMPLE



"The scalability of the NCP-7560 positions it ideally for OEMs designing high bandwidth systems in telecommunications and enterprise networking. It is ideal for applications in service provider networks for enhanced security, deep packet inspection, acceleration and subscriber-based services."

# **Mobility Management Entity (MME)**

#### Introduction

When cellular networks were first conceived they were simply a copycat version of the established voice network, but without the wires. For many years mobile voice remained the primary traffic carried, however, over the last few years data has exhibited dramatic growth that shows no signs of abating. Many believe we will see close to 100x increases over the coming years. Driven by today's ever present smartphone with an "app" for everything, the mobile internet is sucking up as much bandwidth as it can get. To cope with this, 3GPP's Long Term Evolution or LTE was devised with the associated all-IP Evolved Packet Core (EPC) managing the mobile access network. From a relative standing start forecasters are suggesting that by 2012 the EPC will be worth nearly \$2 billion.

LTE really represents the RAN (Radio Access Network) or E-UTRAN with eNodeBs supporting the end user device connections. Evolving from the legacy core network the EPC is comprised of three subcomponents: 1) The Packet Data Network Gateway (PDN GW) that manages the connectivity from the UE/devices to external packet data networks, 2) The Serving Gateway (SGW) which routes and forwards user data packets, and 3) The Mobility Management Entity (MME). The MME is the key control-node for the LTE access-network. It is responsible for many crucial functions including:

- Idle mode UE (User Equipment) tracking and paging procedure including retransmissions
- A significant part of the bearer activation/deactivation process
- User authentication through interaction with the HSS
- Selection of the SGW and PDN GW
- · Replication of the user traffic for lawful interception applications
- Mobility and interaction between the LTE and 2G/3G access networks



Depending on the size of the network, the MME and other elements need to be scalable to meet a multitude of capacities, performance levels and price points.

Flexible, powerful, processing nodes are key elements required when constructing an MME platform. Adherence to open standards linked to the availability of the latest and most powerful silicon makes AdvancedTCA® the ideal architectural choice. Advantech can provide multiple choices when it comes to matching processing blades to the needs of the specific network element. Single or dual Intel® Xeon® based boards are available, such as Advantech's MIC-5320 and MIC-5322, which can be populated with 2-, 4- or 6-core processors and delivering the flexibility to create multiple MME variants. For higher performance requirements, the MIC-5332 based on the Intel® Xeon® E5-2600 Series provides the next step up with latest generation silicon and up to 16 processor cores.

# 12 and 16-Core Intel<sup>®</sup> Xeon<sup>®</sup> 5600 / E5-2600 Series ATCA Blades for Mobility Management Entity (MME) Integration

#### MIC-5332 DUAL INTEL® XEON® E5-2600 SERIES PROCESSOR BLADE

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel® Xeon® E5-2600 series processors. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen. 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.



- Two Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Processors
- Intel® C600 Series PCH server class chipset with integrated SAS controller
- 8 DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Three 1000BASE-T front panel ports
- One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM

#### MIC-5322 DUAL INTEL® XEON® 5600 SERIES PROCESSOR BLADE

The MIC-5322 is a dual processor Intel® Xeon® 5500/5600-based ATCA blade. It enables cost effective, high performance processing with 12-cores and 24-threads of processing power, low DDR3 memory latency, fast PCI Express 2.0 and accelerated virtualization. The Intel 82599 10 GbE controller plays a key role in end-to-end network performance and throughput, including a 5 Gbps PCI Express 2.0 interface to improve the entire data path as well as multi-core optimized queue support. For fast and secure database applications, the blade supports up to 48 GB of triple channel DDR3 with ECC. The flexibility of the Intel® Xeon® 5500/5600 Series allows tremendous upgradeability, scalability and cost efficiency options with two, four or six-core processors fully supported.

- Two 2, 4 or 6-Core Intel® Xeon® 5500 or 5600 processors
- Intel<sup>®</sup> 5520 IOH36D/ICH10R server class chipset
- 6 DDR3 VLP DIMMs up to 48 GB with ECC support
- Two XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Two 1000BASE-T front panel ports
- Two USB2.0 front panel ports
- Fully managed, hot swappable RTM



"Offering the highest available AdvancedTCA performance envelope, network throughput fueled by a 10GbE controller, and database performance assured through the 256GB of triple channel DDR3, Advantech's Intel® Xeon® E5-2600 based ATCA blades are the perfect choice for your SIP Application Server."

# **Quality of Experience (QoE)**

#### Introduction

Quality, Quality, Quality, we hear the word everywhere but what exactly does it mean? Everybody says they have it, but ultimately we should care about quality as an empirical measure. QoS (Quality of Service) has been much used to imply a more specific attribute of quality as well as a feature that allows control over specific traffic flows. QoS is typically linked to one or more defined metrics and an associated SLA (Service Level Agreement), e.g., average bandwidth or latency. Quality of Experience (QoE) is now just as important, if not more so, as it is often more appropriately named "Quality of User Experience." It is a more subjective, qualitative metric rather than the typically empirical QoS, but if the movie you are watching is "choppy" that's all you care about and most importantly that is what will convince a user to switch providers. The demand for equipment that can measure/manage QoE is increasing. The overall market size for specific QoE testing equipment is approximately \$500M; it is growing however, and the contribution towards overall revenue protection and churn prevention should not be underestimated.

Voice networks have used qualitative measurements for many years e.g., MOS (Mean Opinion Score) using both humans and machine simulations. QoE systems can also take both approaches, and as application scenarios differ so do the approaches to measuring and managing. There are, however, a number of common characteristics:

- Segmenting application elements It is crucial to be able to identify which element of an application is responsible for and related to positive and/or negative user experience.
- Real time measurement If one is trying to gauge what a real user might experience, one needs to be able to track the real-time ebbs and flows of the traffic and overall application performance.
- **Packet level inspections** Being able to inspect packets and identify exactly what is going on with an application and specific user at any given point in time is at the core of any QoE system.

Creating a QoE monitoring and measurement solution requires access to the contents of the underlying packets within the network and being able to assess different traffic mixes and scenarios. Technologically, the ideal platform for such an application must bring both network processing and high packet throughput together to maximize subscriber monitoring. This makes Advantech's Packetarium platforms a perfect choice. Based on the industry's latest Network Processors with eight to thirty-two cores and packet acceleration advantages, the NCP-3120 and NCP-7560 bring all the necessary attributes on which to build a QoE application.



#### **Packetarium Network Processor Platforms for QoE Applications**

#### NCP-3120

The NCP-3120, based on the 6-core Cavium OCTEON II CN6335, brings new scalability to the Packetarium range. Network Processor Boards used in the high-end system integrate seamlessly into the 1U platform to facilitate software re-use and allow OEMs to market entry-level variants for cost-sensitive higher volume deployment.



The system is designed with flexibility in mind, and offers a range of replaceable front I/O cards for GbE and 10 GbE connectivity as well as a standard PCIe x8 card expansion slot. With the accelerated packet processing capabilities of the OCTEON II, the NCP-3120 is a cost effective platform that meets a wide range of QoE measurement and enhancement requirements. It also supports up to eight 2.5" SATA-2 Solid State Disks for video stream caching or database applications.

The NCP-3120 runs Debian Linux and will also be available with 6WINDGate software, which simplifies the integration of highperformance packet processing into multi-core networking equipment. The 6WINDGate software solution includes a comprehensive set of high-performance Layer 2 through Layer 4 networking protocols that accelerates time-to-market while maximizing the performance of Packetarium Octeon II-based products.

#### NCP-7560

The NCP-7560 represents the high performance end of Advantech's Packetarium<sup>™</sup> product line. It integrates up to eight powerful, multi-core Packetarium<sup>™</sup> Network Processing Boards for wire-speed packet processing, providing up to 80 Gbps throughput. The main carrier board provides high-speed switched interconnects between boards, along with storage, management and external network connections. Each Network Processing Board is linked by dual XAUI ports to a Broadcom BCM56820 10 GbE switch on the carrier board. The 10 GbE switch also provides six front panel 10 GbE SFP+ ports and sixteen GbE SFP ports via a Broadcom GbE switch. A SAS controller connects to two AMC slots for SAS/SATA 2.5" storage. The carrier board incorporates a Freescale MPC8545 local processor for overall switch and system management and provides two front panel 100 Mbps ports for remote management.

- Scalable from 1 to 8 multi-core Packetarium<sup>™</sup> Network Processing Boards
- Cavium Octeon<sup>™</sup> Plus
- Netlogic XLR
- Freescale QorlQ<sup>™</sup>
- 6 x 10GbE and 16 x 1GbE external interfaces
- 24-port 10GbE switch w/ L2 switch management
- Hot Swappable, 850 W redundant AC or DC power supplies
- SAS/SATA controller for two AMC's with 2.5" storage devices
- Wind River CGL Linux and 6WINDGate<sup>™</sup> support
- Designed for NEBS



# **Unified Threat Management**

#### Introduction

The security of a country is of the highest importance; security for a business's computing resources and networks is similarly important. Both have borders and assets that need protection, and clear ways to identify citizens or authorized users. As networking products and technologies have grown and advanced, so too, unfortunately, have efforts to breach the networks they create. A multitude of point solutions have been developed and implemented, over the years, to protect against a multitude of threats. A market opportunity emerged (2004) to combine multiple security products into a single platform, and the term Unified Threat Management or UTM was coined. In 2009 UTM revenues were close to \$2 billion and recent estimates indicate that by 2016 the market will reach \$7 billion (Frost & Sullivan).

UTM brings together previously disparate security platforms and technologies. A typical UTM solution will have a broad base of functionality including firewall, Virtual Private Network (VPN), network-based anti-virus and anti-spam intrusion prevention, content filtering, user authentication and even load balancing. UTM must now protect against a wide variety of threats from both external and internal sources. While not necessarily complicit in any attack, employees (and their computers/laptops) are being targeted as "softer" entry points into a network. Internal user control and identity-based policies are now increasingly important so as to limit who can do what—e.g., social media— within the confines of an enterprise network. Besides the detailed, lower-level functionality of each of the individual protection components, a UTM platform has the following attributes and benefits:

- Flexible and scalable elements allowing for customized configurations to suit small businesses and major enterprise networks
- · Consolidated solutions limit compatibility or integration issues due to multiple vendor and product overlaps
- · Multiple Gigabit interfaces facilitate high throughput and redundancy
- · Real-time reporting of threats and potential intrusions
- Software and support simplicity through a single management interface to consolidated remote platform management

Coping with the task of running and managing multiple threat protection scenarios requires that the underlying platform architecture has a solid foundation capable of supporting multiple levels of performance and networking. Advantech's portfolio provides the ideal starting point for a range of UTM solutions with 1U rack mount platforms such as the FWA-3210 and 2U FWA-6510 supporting a variety of Intel® Xeon® processing options. At the higher end, scaling to throughputs of over one terabit per second of switching capacity, ATCA platforms based on Advantech's MIC-5332 AdvancedTCA blades supporting up to 16 processor cores round out a variety of flexible options that deliver right at the sweet spots needed to match requirements for any Unified Threat Management platform.



#### **Advantech OEM-Ready Network Appliances for Unified Threat Management**

#### MIC-5332 DUAL INTEL® XEON®E5-2600 SERIES PROCESSOR BLADE

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel® Xeon® E5-2600 series. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.

#### Supports Intel® Xeon® E3-1225/E3-1275 (FWA-3210A) and 2nd generation Core<sup>™</sup> Series Processors

- Supports 4 x DDR3 Un-buffered 1066/1333 DIMMs, up to 32 GB (FWA-3210A); 2x DDR3 Un-buffered 1066/1333 DIMMs, up to16 GB (FWA-3210B)
- 6 x 10/100/1000 Mbps LAN on Board with up to 3 bypass segments
- 1 x 3.5" or 1 x 2.5" SATA HDD / SSD
- 2 x Advantech Network Mezzanine Cards (NMCs)

#### FWA-6510 2U INTEL®XEON® E5-2600 SERIES NETWORK APPLICATION PLATFORM

Based on Intel®s latest Xeon® processor platform, the FWA-6510 system is designed for maximum performance, scalability and functionality in a 2U rack mount footprint. This multi-core processor-based, high-end network communications appliance is optimized for computing power and high speed, high density I/O with best-in-class energy efficiency. Two E5-2600 series Intel® Xeon® processors (Socket R) with up to 8 cores provide the latest architectural enhancements as well as unprecedented I/O integration: Two Intel® QuickPath Interconnects running at up to 8GT/s each support reduced cross-socket memory I/O latencies and increased throughput. Each socket supports 4 DDR3 channels up to 1600 MHz for up to 384 GB of ECC memory when using the latest LR DIMM technology.

- 2 x Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 processors
- DDR3 1333/1600 ECC registered memory, up to 384GB
- PCle gen3 support
- 4 x Network Mezzanine Cards (NMC) slots for a wide range of GbE and 10GbE NMCs with or without bypass
- 1 x PCIe x8 full-height/ half-length add-on card
- 4 x 2.5" removable SAS/SATA HDD and SSDs
- IPMI 2.0-compliant Remote Management



- Two 1000BASE-T ports on Base interface / Three -1000BASE-T front panel ports
  - One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM



The FWA-3210 1U appliance can be configured with a range of Intel® processors, Ethernet ports, PCIe I/O options and Advantech's Network Mezzanine Cards (NMCs) to create costeffective platforms for specific enterprise networking applications. The Appliance is powered by processors utilizing the LGA-1155 socket, including the Intel® Xeon® E3-1225/1275, 2nd generation Intel® Core™ i7-2600/ i5-2400 /i3-2120, the Pentium®-G850 and the Celeron®-G540 Processor, Memory configurations can include 4 x DDR3 1333/1066 DIMMs for up to 32GB in total. In the base configuration, the system comes with a single internal 2.5" SATA HDD bay, 6 Intel® 82574L GbE controllers, and one PCIe x8 expansion slot.







# **IPTV - QoS**

#### Introduction

Utilizing the Internet as a television broadcast medium always seemed like a great idea, although early VoD (Video on Demand) trials might beg to differ. By design, the Internet works hard to ensure all packets are delivered but it doesn't necessarily care when. Not a particular issue if your file transfer takes a bit longer or the website you are browsing is a bit sluggish but in the world of TV one needs a continuous deterministic stream of data to maintain uninterrupted viewing. Infrastructure investment and strict control over QoS (Quality of Service) has made numerous IPTV services possible. Service enhancements and subscriber growth continues as evidenced by the Multi Media Research Group who estimates IPTV service revenue will be worth US\$17.5 billion in 2010 and it's forecasted to grow to US\$46 billion in 2014.

Media Gateways and Media Gateway Controllers (or Softswitches) were originally defined by the IETF. The IMS architecture has extended certain functionality and combined other previously separate functions.

Through tight network management, overall QoS can now easily be controlled within the tolerances required for IPTV. A few functions continue to provide challenges. One such function, so fundamental to TV watching, is changing channels. As viewers, we expect our channel hopping commands to be obeyed instantly. Analogue broadcast TV has all channels available at our TV set simultaneously and a channel change simply resets the tuner to a predesignated frequency. Not so with IPTV; the channel we are watching is a stream of bits flowing down our broadband pipe and switching that channel takes time. It's made worse by the fact that buffering is needed to handle the general issues of IPTV delivery making a raw channel change way longer than a button press and possibly even 8-10 seconds. It's just not possible to have all channels flowing into our homes but they can be prebuffered within the network close to our homes on a network appliance. When we change channels it diverts the appropriate prebuffered stream thus allowing any delays to be minimized.



For IPTV applications such as this, a specialized, network optimized platform is required. Advantech offers choice and flexibility with platforms supporting the industry leading Cavium OCTEON™ OCTEON Plus™ or OCTEON II™ processors. The NCP-3108 comes in a compact 1U form factor utilizing the OCTEON™ 3860 and can support up to 8 Gigabit Ethernet ports. Part of the innovative Packetarium™ range, the NCP-3120 can be configured with any Packetarium™ NPU board including the latest OCTEON II™ based NCPB-2305 and can support multiple interfaces including 10GE. With Advantech's flexible range of NCP platforms it is possible to build a wide variety of solutions for differing IPTV scenarios and implementations.

#### Packetarium<sup>™</sup> Network Processor Platforms for IPTV Applications

#### NCP-3120 1U NETWORK PROCESSOR PLATFORM

The NCP-3120, based on the 6-core Cavium OCTEON II CN6335, brings new scalability to the Packetarium™ range. Network Processor Boards used in the high-end system integrate seamlessly into the 1U platform to facilitate software re-use and allow OEM's to market entry level variants for cost-sensitive higher volume deployment.



The system is designed with flexibility in mind and offers a range of replaceable front I/O cards for GbE and 10 GbE connectivity as well as a standard PCIe x8 card expansion slot. With the accelerated packet processing capabilities of the OCTEON II, the NCP-3120 is a cost effective platform which meets a wide range of IPTV connectivity and bandwidth requirements. It also supports up to eight 2.5" SATA-2 Solid State Disks for data caching or database applications.

The NCP-3120 runs Debian Linux and will also be available with 6WINDGate software which simplifies the integration of high performance packet processing into multi-core networking equipment. The 6WINDGate software solution includes a comprehensive set of high-performance Layer 2 through Layer 4 networking protocols that accelerates time-to-market while maximizing the performance of Packetarium<sup>™</sup> Octeon II –based products.

"Next generation networking and communication infrastructure require ultra dense, very high performance, Deep Packet Inspection capable systems scalable from 10Gbps to 160Gbps," said YJ Kim, Senior Director Embedded Processor Group. "We are pleased that Advantech is able to leverage the latest features of OCTEON II multicore products and to continue delivering innovative solutions to address these requirements to the Telecom and Networking Equipment Providers." "The new OCTEON II processors deliver up to 7x higher performance over our current OCTEON Plus designs in a fully software-compatible fashion, enabling OEM customers to easily upgrade their existing systems for higher performance," said Byron Lin, Director at Advantech's Networks and Telecom Group. "In addition, the power saving technology in OCTEON II significantly reduces the total cost of ownership and more importantly, the overall carbon footprint" he added.

# **Radio Access Networks**

#### Introduction

Mobile telephony as we now know it has been with us since the early 1980s, and the infrastructure of cellular networks has evolved and changed significantly since the original analogue AMPS systems were first introduced. Although architectures have evolved there is still a clear separation between the mobile core and the Radio Access Network or RAN. As the technologies moved from analogue to digital, we added mobile data and stepped up through 2G and 2.5G to today's 3G networks with 4G just around the corner. The RAN is undoubtedly the most significant part of any mobile network and the RNC (Radio Network Controller) and soon to be eNodeB bears the brunt of the workload. This is borne out as one looks at 2009 RAN equipment revenues which were in excess of \$38 billion. Continued growth is forecast over the next 5 years with mobile infrastructure revenues expected to be in the region of \$42 billion by 2014 (Dell'Oro Group).

The RNC is the backbone of the current 3G UTRAN, (UMTS Terrestrial Radio Access Network), providing control functionalities for one or more Node Bs and is responsible for a large part of the management of the radio resource. The growth in broadband data traffic is a major driver. 3G can currently support data rates of approx. 40Mbps, however the road is paved towards rates of 100-300Mbps with new LTE (Long Term Evolution) networks. These new networks will be all-IP and must be structured to support increased data capacities with significantly reduced latency.

The new approach replaces the RNC with a single composite base station – the eNodeB. Looking to the future the eNodeB will be the prevalent workhorse in the new LTE RAN as it takes on responsibility for: radio resource management, radio bearer control, radio admission control, connection mobility control, and the dynamic allocation of both uplink and downlink resources. One key difference in this new architecture will be the ability for a large volume of calls to be routed to devices directly within the same or adjacent cells. Increased security, compression and encryption of data streams adds to the task list for the eNodeB. These more highly complex base stations will require new generations of flexible and powerful processors.

Designed to address just such embedded and access network challenges, the new AMC-4201 from Advantech provides for the needs of high-performance, combined, control and data-plane processing. Based on Freescale's QorIQ P4080 multicore processor and using the AMC (Advanced Mezzanine Card) format the AMC-4201 provides significant flexibility and can be used as part of a larger bespoke design or incorporated into a MicroTCA based eNodeB platform. With the QorIQ having evolved from the highly successful PowerQUICC architecture, which has been used extensively within wireless infrastructure, the AMC-4201 is tailor made for eNodeBs and other LTE applications.

Advantech have also introduced the AMC-4202, an enhanced P5020 version of the AMC-4201. For Control plane applications with similar requirements in both networking and wireless infrastructure, the P5020 AMC is the best fit for processes that derive their performance from a smaller number of higher performance cores, as this minimizes the need to rework legacy code.



# Advanced Mezzanine Cards with Freescale QorlQ<sup>™</sup> for Radio Access Network (RAN) Design

# AMC-4201 Eight POWER ARCHITECTURE™ PROCESSOR CORES WITH HIGH-PERFORMANCE DATAPATH ACCELERATION LOGIC AND NETWORK INTERFACES

The AMC-4201 is a single-width, mid-size AMC based on the Freescale P4080 processor. It combines eight Power Architecture® e500 cores operating at frequencies up to 1.5 GHz with high-performance, datapath acceleration logic, extensive networking I/O, and peripheral bus interfaces. It combines powerful multi-core Power Architecture performance with network processing capabilities, and builds on the communications ubiquity of Freescale's PowerQuicc® product family. AMC-4201 provides 2, 4 and 8 GB build options for onboard DDR3 memory at 1333 MHz with ECC support. One front-panel 10GbE SFP+ connector provides network access in addition to a front panel console and debug port.

- Freescale P4080 8-core e500-mc PowerPC, up to 1.5 Ghz
- Up to DDR3 1600Mhz 8GB with ECC support
- 4 MB SPI Flash and 2 GB NAND Flash
- Optional SerDes Lane (PCIe/SGMII/SRIO)
- One 10GbE SFP+ for external access
- AMC.0, AMC.1, AMC.2, and AMC.4 compliant and Configurable SERDES channel support
- Max power consumption 40W, typical less than 32W
- Clock Sync support 8Khz and 19.44Mhz
- Wind River Vxworks Support

#### AMC-4202 64-BIT DUAL-CORE COMMUNICATIONS PROCESSOR

The AMC-4202 is a single-width, mid-size AMC based on the Freescale P5020 processor. It combines two 64-bit ISA Power Architecture<sup>™</sup> processor cores with high-performance datapath acceleration logic and network and peripheral bus interfaces required for networking, telecommunications, and wireless infrastructure. The P5020 can be used for control processing in applications such as routers, switches, internet access devices, firewall and other packet filtering processors, network attached storage, storage area networks, imaging and general-purpose embedded computing. Its high level of integration offers significant performance benefits and greatly helps to simplify board design. AMC-4202 provides 4 and 8 GB build options for onboard DDR3 memory at 1333 MHz with ECC support. One front-panel 10GbE SFP+ connector provides network access in addition to a front panel console and debug port.

- Freescale P5020 2 cores 64bit e5500 PowerPC, up to 2.0Ghz
- Up to DDR3 1333Mhz 8GB with ECC support
- 4MB SPI Flash and 2GB NAND Flash
- Optional SerDes Lane (PCIe/SGMII/SRIO)
- 1GbE/10GbE capability for external access
- Clock Sync support 8Khz and 19.44Mhz
- Efficient power consumption, typical 32W
- Two SATA interfaces
- AMC.0/.1/.2/.3/.4 compliant









#### **Enabling an Intelligent Planet**

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#### Securing and Connecting the Network

Specifically designed to meet the requirements of network security OEMs and equipment providers, Advantech's network application platforms offer the highest performance and widest scalability with throughputs ranging from 10Gbps in 1U to over 2.4Tbps of switching capacity in a 16-slot ATCA system.

From Intel® Atom™ to Core™i7 and Xeon®, covering multi-core MIPS® & PowerPC® network processors, OEMs can choose from the latest generation silicon, the fastest and most reliable LAN access devices, and specialized hardware accelerators to respond to their customers' growing needs for performance and application consolidation.

With OEM-readiness in mind, Advantech offers a complete range of customization options from branding, packaging and global logistics to hardware customization and design services for a differentiated OEM offering, providing first mover advantages with fastest time to market.



#### **FWA-3210** 1U Intel<sup>®</sup> Xeon<sup>®</sup> E3-1200 based **Network Application Platform**

- Intel<sup>®</sup> Xeon<sup>®</sup> E3-1200 Series and 2nd gen Core Series Processors
- · 4 x DDR3 Un-buffered 1066/1333 DIMMs, up to 32 GB (FWA-3210A)
- 6 x GbE ports, 1 x 3.5" or 1 x 2.5" SATA HDD / SSD



#### FWA-6510 2U Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 based Network Application Platform

- 2 x Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 processors DDR3 1066/1333 ECC registered memory,
- up to 96 GB
- PCle gen3 support



#### NCP-7560 4U 8-way Packetarium™ Network Processor Platform

- Advantech Packetarium<sup>™</sup> design
- Scalable from 1 to 8 multi-core Packetarium™ network processing boards
- SAS/SATA controller for 2 x AdvancedMC's with 2.5" storage devices

www.advantech.com.tw/nc

# **MIC-5320**

#### AdvancedTCA® 10GbE CPU Blade with Intel® Xeon® 5500/5600 Series Processor



#### Features

- One 2, 4 or 6-Core Intel<sup>®</sup> Xeon<sup>®</sup> 5500 or 5600 processors
- Intel<sup>®</sup> 5520 IOH36D / ICH10R server class chipset
- Six DDR3 VLP DIMMs up to 48 GB with ECC support
- Two XAUI ports on Fabric interface
- Two 1000 Mbps ports on Base interface
- Three 1000 Mbps front panel ports
- One mid-size AMC slot with SAS/PCIe/RTM support
- Onboard serial attached SCSI (SAS) controller with failover support
- Fully managed, hot swappable RTM



#### Introduction

Advantech's MIC-5320 single-slot AdvancedTCA<sup>®</sup> processor blade combines computing performance with I/O flexibility in a power efficient design. Supporting Intel's latest Xeon<sup>®</sup> processors using the new Intel<sup>®</sup> Xeon<sup>®</sup> 5500/5600 microarchitecture and latest DDR3 technology with a 3 channel memory controller integrated into the CPU, the MIC-5320 outperforms previous generation dual socket designs while providing better thermal characteristics. The flexibility of the Intel<sup>®</sup> Xeon<sup>®</sup> 5500 and 5600 Series allows tremendous upgradeability, scalability and cost efficiency options with two, four or six-Core processors fully supported.

Using Intel's latest GbE and 10GbE MAC solutions supporting enhanced offloading techniques and virtualization features, MIC-5320 allows users to deploy the full power of multi-Core technology. All in all, by combining the latest multi-Core technology, low latency / high speed DDR3 technology, and latest 10GbE technology, MIC-5320 is well suited for high speed data plane applications. Supporting up to 48 GB of memory it can run database in memory applications easily. It is backed up by a 4 channel SAS RAID controller that makes it equally suitable for control plane applications that require disk I/O with RAID and failover support.

The mid-size AMC bay supports more than just mass storage AMCs. With support for PCIe x4 gen 2 as well as base fabric channels, it opens up possibilities for high speed I/O interface integration and co-processing engines. In addition to utilizing the chipset's RASUM features, redundant BIOS flashes enhancements to BIOS and firmware to support CMOS backup, and override and HPM.1 upgradeability, make the MIC-5320 a true carrier grade solution.

MIC-5320's overall design and built-in flexibility using FPGA technology, and RTM customization further enlarge the application fields of this product and reduce time-to-market. Advantech's world class customization services are ready to tune the MIC-5320 to meet customer-specific requirements.



# **Specifications**

	CPU	L5508 (2C/4T), L5518 (4C/8T) or L5638 (6C/12T) Intel Xeon processor*					
Processor System	Max. Speed	2.13 GHz					
	Chipset	Intel 5520 IOH36D / ICH10R					
	BIOS	Dual 16-Mbit BIOS firmware flashes with AMI embedded BIOS					
	QPI	5.86 GT/s					
	Technology	Triple channel DDR3 1066/1333 MHz SDRAM (72-bit ECC Un-/ Registered)					
Memory	Max. Capacity	Configurable up to 48 GB					
	Socket	6 VLP DIMMs	6 VLP DIMMs				
Zono D	Fabric Interface	i82599 Dual 10GE MAC/PHY supporting two 10 Gbp	i82599 Dual 10GE MAC/PHY supporting two 10 Gbps ports (XAUI)				
ZUTIEZ	Base Interface	i82576 PCIe dual GbE MAC/PHY supporting two 10,	i82576 PCIe dual GbE MAC/PHY supporting two 10/100/1000 Mbps ports				
	Serial (COM)	2 x 16C550 compatible Serial Ports (1 RJ-45 connec	tor, 1 miniUSB connector)				
Front I/O Interface	Ethernet	2 x 10/100/1000 Mbps through PCIe based i82576 I	MAC/PHY, 1x 10/100/1000 Mbps Chipset LAN				
	USB 2.0	2 x Type A ports					
Operating System	Compatibility	WindRiver PNELE3.0, RedHat Enterprise 5.3, Micros	oft Windows Server 2003, Windows Server 2008				
IDMC	Controller	Renesas H8S/2166					
IPIVIG	IPMI	Compliant with IPMI 1.5 using Pigeon Point System® (PPS) Solution					
Watahdag Timar	Supervision	1 BMC, 1 x86 BIOS POST, OS Boot, Application					
watchuog Timer	Interval	IPMI compliant					
	Site	1 mid-size AMC bay	1 mid-size AMC bay				
AIVIG	Interface	SAS/SATA, PCI Express x4, RTM					
Minaellanaeue	Storage	CF onboard, 4-port SAS controller LSI1064E (1 to A	MC, 3 to zone 3)				
wiscenarieous	Real Time Clock	Built-in					
Zono 2 (DTM)	RTM	Advantech common RTM interface Type 1					
	Interface	4x SAS, 2x PCIex4, 2x SGMII, 4x USB, 2x UART, 2x SATA, SGPIO, AMC ports 14, 1720					
Dower Dequirement	Configuration	Xeon L5518 + 12GB DDR3 SDRAM, no AMC, no RT	M				
rower nequirement	Consumption	128 W					
Dhugiaal Characteristics	PCB Dimensions (W x D)	6HP, 322.25 x 280.00 mm (12.69" x 11.02")					
Physical characteristics	Weight	2.675 kg					
		Operating	Non-operating				
	Temperature	0 ~ 55° C (32 ~ 131° F)	-40 ~ 70° C (-40 ~ 158° F)				
Environment	Humidity	5 to 93% @ 40° C (non condensing)	95% @ 40° C (non-condensing)				
	Shock	4 G each axis	-				
	Vibration (5 ~ 500 Hz)	1.5 Grms	2.16 Grms, 30 mins each axis				
	Environment	ETSI EN300019-2-1 Class1.2, EN300019-2-2 Class	2.3, ETSI EN300019-2-3 Class 3.1E				
	Environment	Designed to meet GR63-Core					
Compliance	PICMG	3.0 R3.0, 3.1 R1.0, AMC.0 R2.0, AMC.1 R2.0, AMC.	2, AMC.3, HPM.1				
	EMC	FCC47 CFR Part15, Class A, CE Mark (EN55022/EN55024/EN300386)					
	EIVIG	Designed to meet GR1089-Core					

\*Note: The MIC-5320 also supports non-NEBS compliant CPU SKU E5540 and E5645 but depends on the system airflow.

### **Ordering Information**

Part Number	Description
MIC-5320-S1E	MIC-5320 bare board
MIC-5320A0-S1E	MIC-5320 with 2C/4T CPU L5508
MIC-5320A1-S1E	MIC-5320 with 4C/8T CPU L5518
MIC-5320B1-S1E	MIC-5320 with 6C/12T CPU L5638

#### **Related Products**

Part Number	Description
MIC-5401	SAS HDD Carrier AMC
MIC-5212	Dual 10 Gigabit Ethernet AMC
MIC-5203-AE	Quad SFP Gigabit Ethernet AMC
MIC-5203-BE	Quad RJ-45 Gigabit Ethernet AMC
RTM-5101	RTM Module for MIC-5320
9680013405	AMC mid-size filler with baffle

# **MIC-5322**

# AdvancedTCA® 10GbE Dual Socket CPU Blade with Intel® Xeon® 5500/5600 Series Processor



#### Introduction

The MIC-5322 is a dual processor Intel<sup>®</sup> Xeon<sup>®</sup> 5500/5600-based ATCA blade complementing the single processor MIC-5320 for systems able to cool over 200W per-slot. The underlying architecture and drivers remain identical to the MIC-5320 thereby enhancing performance scalability and streamlining software re-use between blades. The MIC-5322 enables the highest performance available in ATCA form factor with 12-Cores and 24-threads of processing power, low DDR3 memory latency, fast PCI Express 2.0 and accelerated virtualization. The Intel<sup>®</sup> 82599 10 GbE controller plays a key role in end-to-end network performance and throughput, including a 5 Gbps PCI Express 2.0 interface to improve the entire data path as well as multi-Core optimized queue support. For fast and secure database applications, the blade supports up to 48 GB of triple channel DDR3 with ECC. The flexibility of the Intel<sup>®</sup> Xeon<sup>®</sup> 5500 and 5600 Series allows tremendous upgradeability, scalability and cost efficiency options with two, four or six-Core processors fully supported.

The MIC-5322 adheres to Advantech's common rear transition modules (RTM) definition developed to maximize interoperability and re-use between RTM's and ATCA blades. This defines the management interface and RTM port mapping for interconnects such as USB, PCIe, XAUI and SAS and allow RTM re-use among blades to simplify system integration as well as life cycle and upgrade management. The MIC-5322 provides hot-swappable RTM support for High Availability(HA) needs as well as rear I/O and SAS storage support with RAID via the RTM-5101.

A CompactFlash socket is available for True IDE mode flash usage. Serial over LAN (SoL) support is provided on the base fabric and external GbE. HPM.1 based updates are available for all programmable components including rollback support and IPMI controlled BIOS write protect through a single update procedure. CMOS Override capabilities allow CMOS RAM to be altered over IPMI and settings can be changed from multiple sources. MAC address mirroring allows the MAC address to be read over IPMI even if the processor is powered down and helps to relate MAC address and physical/logical board location. Additional support is provided for Intel® PECI, application driven event logging and FRU EEPROM space is reserved for ODM use.

1.8" SSD (option) Two 10/100/1000BASE-T ports Two USB ports Discrete ports

On-board FPGA design facilitates customer-specific modifications and the Core board design can be modified or adapted to other form factors through Advantech's D&MS customization services

# **Specifications**

	CPU	L5518 (4C/8T), E5540 (4C/8T), L5638 (6C/12T) or E5645 (6C/12T) Intel Xeon processor*				
Drooppor Custom	Max. Speed	2.53 GHz				
PIOCESSOI SYSTEIII	Chipset	Intel IOH36D/ICH10R				
	BIOS	Dual 16-Mbit BIOS firmware flashes with AMI embedded BIOS				
Bus	QPI	5.86 GT/s				
	Technology	Triple channel DDR3 1066 / 1333 MHz SDRAM (72-bit ECC Un-/Registered)				
Memory	Max. Capacity	Configurable up to 48 GB				
	Socket	6 VLP DIMMs				
7one 2	Fabric Interface	i82599 Dual 10GE MAC/PHY supporting two 10GBase KX4 ports (XAUI)				
20118 2	Base Interface	i82576 PCIe dual GbE MAC/PHY supporting two	10/100/1000 Mbps ports			
	Serial (COM)	2 x86 Serial Ports (1 RJ-45, 1 USB slave)				
Front I/O Interface	Ethernet	2 10/100/1000BASE-T through PCIe based i8257	76 MAC/PHY			
	USB 2.0	2 Type A ports				
Operating System	Compatibility	WindRiver PNELE3.0, RedHat Enterprise 5.3, Mic	crosoft Windows Server 2003, Windows Server			
oporating oystom		2008				
	BMC Controller	Renesas H8S/2166				
IPMC	IPMI	Compliant with IPMI 1.5 using Pigeon Point System <sup>®</sup> (PPS) Solution				
	Hardware Monitor	NuvoTon W83795ADG				
Watchdog Timer	Supervision	1 BMC, 1 x 86 BIOS POST, OS Boot, Application				
	Interval	IPMI compliant				
	LED Indicators	12				
Miscellaneous	Storage	Unboard CF Disk, 2 x internal and external SAS drives through RTM module				
	Real Time Clock	Built-in				
Zone 3 (RTM)	RTM	Advantech common RTM interface Type 1				
	Interface	<u>3PCIe x 4, 2 x SAIA, 2 x SGMII, 2 x USB, 2 x UAI</u>	RI, SGPIO			
Physical Characteristics	Dimensions (W x D)	6HP, 322.25 x 280.00 mm (12.69" x 11.02")				
	Weight	2.545 kg				
	<b>T</b> .	Operating	Non-operating			
	lemperature	0 ~ 55° C (32 ~ 131° F)	-40 ~ /0° C (-40 ~ 158° F)			
Environment	Humidity	5 to 93% @ 40° C (non condensing)	95% @ 40° C (non-condensing)			
	Shock	4 G each axis	-			
	Vibration (5 ~ 100 Hz)	1.5 Grms 2.16 Grms, 30 mins each axis				
	Environment	ETSI EN300019-2-1 Class1.2, EN300019-2-2 Class 2.3, ETSI EN300019-2-3 Class 3.1E				
	PICMG	3.0 R3.0, 3.1 R1.0, HPM.1				
Compliance		CE mark (EN60950-2001), UL60950-1/CSAC22.2				
	Satety & EMC	FUU4/ UFN FAILID, UIASS A, UE IVIAIK (EIVOOUZZ/EIVOOUZ4/EIVOUUSSO)				
		Designed to meet GB1089-Core				

\*Note: Specs of E5540 and E5645 processors do not allow NEBS compliance.

### **Ordering Information**

Part Number	Description
MIC-5322S1-P0E	10GbE Ethernet fabric interface, bare board no CPUs, no memory, no CF disk
MIC-5322S1-P1E	10GbE Ethernet fabric interface, Dual Intel Xeon L5518 CPUs, no memory, no CF disk
MIC-5322S1-P2E	10GbE Ethernet fabric interface, Dual Intel Xeon E5540 CPUs, no memory, no CF disk
MIC-5322S1-P3E	10GbE Ethernet fabric interface, Dual Intel Xeon L5638 CPUs, no memory, no CF disk
MIC-5322S1-P4E	10GbE Ethernet fabric interface, Dual Intel Xeon E5645 CPUs, no memory, no CF disk

### **Related Products**

Part Number	Description
RTM-5101-A1E	RTM Module (hosts LSi1064e SAS controller and two hotswappable SAS HDD and rear panel IO connectors)

# **MIC-5332**

# AdvancedTCA® 10GbE Dual Socket CPU Blade with Intel® Xeon® E5-2600 Processors



#### **Features**

- Two Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Processors
- Intel<sup>®</sup> C600 Series PCH server class chipset with integrated SAS controller
- · Eight DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface
- Two 1000BASE-T ports on Base interface
- Three 1000BASE-T front panel ports
- One Fabric Mezzanine Module support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage Device
- Fully managed, hot swappable RTM



Networks

#### Introduction

Advantech's MIC-5332 is a dual processor ATCA blade based on the Intel next generation platform. It enables the highest performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, fast PCI Express gen. 3 lanes running at up to 8Gbps, and best in class virtualization support. Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5332 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.

Using Intel's latest PCH with its integrated 4-port SAS controller, the need for an external storage controller is eliminated making the MIC-5332 an ideal choice for cost sensitive control plane applications. While supporting two XAUI interfaces in the base model, support for dual dual star fabric implementations can be added by installing the FMM-5001B Fabric Mezzanine Module (FMM). Beyond that, the Fabric Mezzanine Module type II socket with PCIe x16 connectivity provides extension possibilities for additional front port I/O, offload and acceleration controllers such as Intel QuickAssist™ accelerators, IPSec offload engines or customer specific logic. FMMs do not only have higher PCI Express bandwidth than AMCs, but also do integrate well in terms of thermal design and board real estate when compared to Advanced Mezzanine Cards. Moreover, FMMs can be reused on RTMs and across different blade designs. This unmatched flexibility combined with the highest performance Intel Xeons available make the MIC-5332 equally well suited for application and data plane workloads.

The onboard IPMI firmware was developed entirely by Advantech to offer greater modularity and flexibility for the customization of system management features especially when it comes to tailoring a system design to meet target cost points without sacrificing features and time to market. HPM.1 based updates are available for all programmable components (BIOS, IPMC firmware, FPGA) including rollback support. Advantech's IPMI solution, combined with an optimized AMI UEFI BIOS continues to offer advanced features used on previous generation MIC-532x blades, such as BIOS redundancy, Real Time Clock Synchronization, CMOS Backup, CMOS Override and MAC Mirroring. Advantech IPMI firmware has been tested for CP-TA compliance using the Polaris Networks ATCA Test Suite.

The MIC-5332 supports hot-swappable RTMs such as the RTM-5104 for High Availability (HA) needs, rear I/O and dual SAS storage with RAID as well as an optional FMM (Fabric Mezzanine Module). Please contact Advantech for more information on available RTMs. On-board FPGA design facilitates customer-specific modifications and the core board design can be modified or adapted to other form factors through Advantech's DMS customization services.



# **Specifications**

	CPU	Two Intel Xeon E5-2600 processors*				
Processor System	Max. Speed	2.1 GHz				
	Chipset	Intel C600 Series PCH server class chipset				
	BIOS	Dual 64-Mbit BIOS firmware flashes with AMI UEFI based BIOS				
	QPI	8.0 GT/s				
	Technology	Four channel DDR3 1066/1333/1600MHz SDRAM (7	2-bit ECC Un-/ Registered), LR DIMM support			
Memory	Max. Capacity	Configurable up to 256 GB				
	Socket	8 VLP DIMMs				
Zone 2	Fabric Interface	2 x Intel 82599 Dual 10GE MAC/PHY supporting four 10GBase ports (XAUI) (one by default and the second one is optional, through FMM-5001B)				
	Base Interface	i350 quad GbE MAC/PHY supporting two 10/100/100	i350 quad GbE MAC/PHY supporting two 10/100/1000 Mbps ports			
	Serial (COM)	2 x 16C550 compatible Serial Ports (1 RJ-45 connect	or, 1 mini-USB connector)			
Front I/O Interface	Ethernet	2 x 10/100/1000BASE-T through PCIe based i350 M/	AC/PHY, 1x 10/100/1000 Mbps Chipset LAN			
	USB 2.0	2 x Type A ports				
Operating System	Compatibility	WindRiver PNE/LE 4.2, RedHat Enterprise 6.1, CentO	S 6.1, Windows Server 2008			
IPMC	BMC Controller	NXP LPC1768 (ARM7)				
	IPMI	Compliant with IPMI 1.5 using Advantech IPMI code	Dase			
Watchdog Timer	Supervision	1 for x86 BIOS POST, OS Boot, Application				
	Interval	IPMI compliant				
FMM	Site	1 FMM type II socket				
	Interface	1 x PCle x16 or 2 x PCle x8				
Miscellaneous	Storage	2 x CFast / 1 x 2.5" SSD*, 4-port SAS controller integ	rated in in PCH to zone 3			
Wilsoonanooda	Real Time Clock	Built-in				
Power Requirement	Configuration	2 x 70 W CPUs, 32 GB memory, no FMM, no RTM				
	Consumption	230 W (estimated)				
Zone 3 (RTM)	RTM	Advantech common RTM interface Type 2				
	Interface	4 x SAS/SATA, 1 x PClex16, 4 x USB, 2 x UART				
Physical Characteristics	Dimensions (W x D)	6HP, 322.25 x 280.00 mm (12.69" x 11.02") (PCB siz	e)			
	Weight	3.275 kg				
		Operating	Non-operating			
	Temperature	0 ~ 55° C (32 ~ 131° F)	-40 ~ 70° C (-40 ~ 158° F)			
Environment	Humidity	5 to 93% @ 40° C (non condensing)	95% @ 40° C (non-condensing)			
	Shock	4 G each axis	20 G each axis			
	Vibration (5 ~ 500 Hz)	0.5 Grms	2.16 Grms, 30 mins each axis			
	Environment	ETSI EN300019-2-1 Class1.2, EN300019-2-2 Class 2	2.3, ETSI EN300019-2-3 Class 3.1E			
Compliance		Designed to meet GR63-CORE				
	PICMG	3.0 R3.0, 3.1 R1.0, HPM.1				
	Safety	CE mark (EN60950-2001), UL60950-1/CSAC22.2				
	EMC	FCC47 CFR Part15, Class A, CE Mark (EN55022/EN55024/EN300386) Designed to meet GR1089-CORE				

\*Note: 1. MIC-5332 supports 2 x 95 W CPUs in non-NEBS environments. Special system airflow requirements apply.

2. CFast and 2.5" SSD are mutually exclusive.

### **Ordering Information**

#### **Related Products**

Part Number	Description			
MIC-5332SA1-P1E	MIC-5332 RJ45 version with dual E5-2648L CPUs			
MIC-5332SA1-P2E	MIC-5332 RJ45 version with dual E5-2658 CPUs			
Contact Advantech for information on available and future RTMs and FMMs.				

Part Number	Description
RTM-5104	RTM Module for MIC-5332
FMM-5001B	Intel 82599 dual 10GE FMM for dual dual star configuration
FMM-5001F	Intel 82599 dual 10GE FMM with 2x SFP+ LAN IO
FMM-5002	VGA FMM module

# **MIC-5333**

#### AdvancedTCA, Dual Socket CPU Blade with Intel® Xeon® E5 Series Processors, Dual-Dual 40G Fabric Interface and Acceleration Support



#### Features

- Two 8-Core Intel<sup>®</sup> Xeon<sup>®</sup> E5 Series processors
- Future Intel<sup>®</sup> chipset code name Cave Creek
- Eight DDR3 VLP DIMMs with ECC support
- Up to four 40GBaseKR4 ports on Fabric interface to support Dual-Dual Star Topology
- Other fabric configurations supported via two Fabric Mezzanine sites (type I)
- Two 10/100/1000BASE-T front panel ports
- One Fabric Mezzanine Module (type II) for optional front IO or additional acceleration
- Fully managed, hot swappable RTM with 36 PCIe gen.3 lanes



=>>>

#### Introduction

Advantech's MIC-5333 is a 40G dual processor ATCA blade based on the next generation Intel<sup>®</sup> communications platform codename Crystal Forest. It enables the highest network and packet processing performance available in ATCA form factor with up to 16 cores and 32 threads of processing power, scalable offload based on Intel<sup>®</sup> QuickAssist<sup>®</sup> technology and support for up to four 40G fabric ports. Fast PCI Express gen. 3 technology running at up to 8Gbps per lane and best in class virtualization support combined with superior thermal design make it ideal for high performance applications and workload consolidation on Intel<sup>®</sup> architecture.

Two QPI interfaces between the CPUs improve memory and I/O access throughput and latencies when one processor needs to access resources hosted by the other socket. With four DDR3 DIMMs per socket in a quad channel design running up to 1600MT/s, the MIC-5333 not only offers superior memory bandwidth over 3-channel designs, but can also support memory densities up 256GB using latest LR DIMM technology. It outperforms previous generation dual socket designs while keeping similar thermal characteristics with balanced airflow resistance.

Fabric connectivity is implemented using up to two FMM type I sites, each site connecting to two backplane fabric channels. This allows the MIC-5333 to scale from legacy 10GE to high speed 40GE network interfaces as well as optional dual dual star support for the most demanding applications in high end data and enterprise networking utilizing 4 hub blades per system. A variety of standard FMMs can be used to implement 10GBaseKX4,multiple 10GBaseKR & 40GBaseKR4 interfaces. Beyond that, a Fabric Mezzanine Module type II socket with PCIe x8 connectivity provides extension possibilities for additional front port I/O, offload and acceleration controllers such as the future Intel® chipset code name Cave Creek, IPSec offload engines or customer specific logic. FMMs have higher PCI Express bandwidth than AMCs, and integrate better in terms of thermal design, cost and board real estate. Moreover, FMMs can be reused on RTMs and across different blade designs. This unmatched flexibility combined with the highest performance Intel® Xeons available make the MIC-5333 equally well suited for application and data plane workloads.

The onboard IPMI firmware based on Advantech's IPMI core offer greater modularity and flexibility for the customization of system management features, and provides the framework for added value features enhancing Reliability, Availability, Serviceability, Usability and Manageability (RASUM) of the product. HPM.1 based updates are available for all programmable components (BIOS, BIOS Settings, IPMC firmware, FPGA) including rollback support. Advantech's IPMI solution, combined with an optimized UEFI BIOS continues to offer advanced features used on previous generation MIC-532x blades, such as Dynamic Power Budgeting, BIOS redundancy, Real Time Clock Synchronization, CMOS Backup, CMOS Override and MAC Mirroring. Advantech IPMI firmware has been tested for CP-TA compliance using the Polaris Networks ATCA Test Suite and against a variety of AdvancedTCA shelf management solutions.

The MIC-5333 connects 36 PCIe gen.3 lanes to the zone 3 interface for a maximum of IO bandwidth to hot-swappable RTMs such as the RTM-5104, supporting rear I/O connectivity and an optional FMM (Fabric Mezzanine Module). Please contact Advantech for more information on available RTMs. On-board FPGA design facilitates customer-specific modifications and the core board design can be modified or adapted to other form factors through Advantech's DMS customization services.



All product specifications are subject to change without notice

# **Specifications**

	CPU	Dual Intel Xeon E5 Series processors*			
Processor System	Max. Speed	E5-2648L: 1.8 GHz (TDP 70W, 8 Cores/16 Threads, 20M L3 Cache) E5-2658: 2.1 GHz (TDP 95W, 8 Cores/16 Threads, 20M L3 Cache)			
	Chineat	Future Intel chinset code name Cave Creek			
	BIOS	Redundant 6/2-Mhit RIOS firmware flashes with AMI LIFEI based RIOS			
	ΩPI	Regulation of the programmed internation with Aivin of the pased bios			
	Technology	Four channel DDB3 1066/1333/1600MHz SDBAM (72-bit ECC	CLIn-/ Registered) LB DIMM support		
Memory	Max Canacity	Configurable up to 256 CB			
womory	Socket	8 VI P DIMMs			
Zone 2	Fabric Interface	4/8 x 10GBaseKR with dual star backplane topology supported (via FMM-5001Q) 2/4 x 40GBaseKR4 with dual / dual-dual start backplane topology supported (via FMM-5004M/5004MM)			
	Base Interface	i350 quad GbE MAC/PHY supporting two 10/100/1000Base-T	ports		
	Serial (COM)	2 x 16C550 compatible Serial Ports (1 RJ-45 connector, 1 mini	i-USB connector)		
Front I/O Interface	Ethernet	2 x 10/100/1000BASE-T through PCIe based i350			
	USB 2.0	2 x Type A ports			
Operating System	Compatibility	WindRiver Linux, RedHat Enterprise, CentOS6.1, Windows Ser	ver 2008		
IPMC	BMC Controller	NXP LPC1768 (Cortex M3)			
	IPMI	Compliant with IPMI 2.0using Advantech IPMI code base			
Watchdog Timer	Supervision	1 for x86 BIOS POST, OS Boot, Application			
	Interval	_IPMI compliant			
	Site	1 FMM type II socket, 2 FMM type I sockets			
FMM	Interface	FMM type I: 2 x PCIe x8 from CPU sockets 0 and 1 FMM type II: one PCIex8 from CPU socket 1			
Missellenseus	Storage	2 x MO-297 SSD			
WISCENdrieous	Real Time Clock	Built-in			
Power Requirement	Configuration	2x E5-2658 (TDP 95W),8 x DDR3 1600 8GB VLP Memory, FM FMM-5001F (Single Niantic, with 2x SFP+ output to Front Par	M-5001Q (Quad Niantic for FI) , nel)		
r ower nequirement	Consumption	Input Voltage: -48V / 2/4W (Preliminary) Input Voltage: -60V / 279W (Preliminary)			
Zone 3 (RTM)	RTM	Advantech common RTM interface Type 2			
	Interface	2 x PClex16, 1 x PClex4, 2 x USB, 1 x UART, , 1 x COM			
Physical Characteristics	Dimensions (W x D)	6HP, 322.25 x 280.00 mm (12.69" x 11.02") (PCB size)			
	Weight	3.275 kg			
		Operating Nor	n-operating		
	Temperature	0 ~ 55° C (32 ~ 131° F) -40	~ 70° C (-40 ~ 158° F)		
Environment	Humidity	5 to 93% @ 40° C (non condensing) 95%	% @ 40° C (non-condensing)		
	Shock	4 G each axis 20 G	G each axis		
	Vibration (5 ~ 500 Hz)	0.5 Grms 2.16	6 Grms, 30 mins each axis		
	Environment	ETSI EN300019-2-1 Class1.2, EN300019-2-2 Class 2.3, ETSI	EN300019-2-3 Class 3.1E		
<b>0</b>		Designed to meet GR63-CORE			
Compliance	PICMG	3.0 R3.0, 3.1 R1.0, HPM.1			
	EMC	ECC47 CER Part15, Class A, CE Mark (EN55022/EN55024/EN300386) Designed to meet GR1089-CORE			

\*Note. MIC-5333 will be compliant to PICMG3.1R2.0 when released.

# **Ordering Information**

Part Number	Description
MIC-5333N-P01	with dual 8C/16T 70W (E5-2648L) CPUs and FMM- 5001Q for Four 10GBase KR FI interface, no memory, no M0-297 SSD
MIC-5333N-P02	with dual 8C/16T 95W (E5-2658) CPUs and FMM- 5001Q for Four 10GBase KR FI interface, no memory, no M0-297 SSD
MIC-5333M-P01	with dual 8C/16T 70W (E5-2648L) CPUs and FMM- 5004M for 40GBaseKR4 FI interface, no memory, no MO-297 SSD
MIC-5333M-P02	With dual 8C/16T 95W (E5-2658) CPUs and FMM- 5004M for 40GBaseKR4 FI interface, no memory, no MO-297 SSD

Contact Advantech for information on available and future RTMs and FMMs.

# **FMM Series**

#### Extension Modules for Advantech CPU Boards

RoHS



#### **Features**

- PCIe based extension modules for ATCA CPU & RTM boards
- Implicit e-keying support
- Ideal to add additional I/O or customer-specific functionality to a standard product:
  - Different or additional I/O on a blade
  - Accelerators and offload engines to a platform
  - Backplane fabric ports on a blade
- FRU EEPROM on mezzanine for management
- Smaller, lower power and less expensive than AMC modules

#### Introduction

Advantech's Fabric Mezzanine Modules (FMM) provide additional flexibility to Advantech ATCA CPU and RTM boards. Additional flexibility can can be I/O ports such as 10GE SFP+ ports, 40g networking, VGAserver type graphics module, PCIe expressed based offload, as well various FI interfaces for ATCA CPU boards. Fabric Mezzanine Modules facilitate ease of system customization by using standard CPU boards and RTM's.

Fabric Mezzanine Modules have a PClex8 or x16 high speed local CPU / processor interface, which can be routed to local resources, or ATCA Zone 2/3. Advantech has defined two types of modules, Fabric mezzanine Type I and Fabric mezzanine Type II, offering different functionality dependent on the host board. Type I FMMs are internal mezzanines with PCle and fabric connectivity, provide 4x 4 lanes custom fabric, such as XAUI, KR, or KR4. Type II FMMs have the same PCB shape as Type I modules, but support I/O connectors and front panel mounting. With one PClex16 or two PClex8 gen.3 ports routed to the front CPU blade, the FMM socket is a perfect solution for I/O port expansion, and also customer-defined acceleration and interfaces. As FMM modules are less complex than AMC modules, customers can deploy faster with a customized design.



# **Specifications**

	Fabric mezzanine type I*								
	FMM-5001B	Intel 82599EB	Intel 82599EB						
	FMM-5001Q	4 x Intel 82599ES							
Main Chin /	FMM-5004M	Mellanox CX3							
FMM type	FMM-5004M	Mellanox CX3							
	Fabric mezzanine type II								
	FMM-5001F	Intel 82599ES							
	FMM-5002	Silicon Motion SM	Silicon Motion SM75						
	FMM-5006	Under NDA, Intel	QuickAssist Acceler	ator					
Managamant	EEPROM FRU	Microchip 24LC3	2A						
wanayement	Thermal IC	TI TMP75AIDR							
	FMM-5001B	Dual ports XAUI to	o backplane						
	FMM-5001F	2 SFP+							
Drotocol / 1/0 porto	FMM-5001Q	Dual ports 4 x KR	to backplane						
	FMM-5002	VGA							
	FMM-5004M	Dual ports KR4 to backplane							
	FMM-5006	Quick Assist							
Power Pequirement		FMM-5001B	FMM-5001F	FMM-5001Q	FMM-5002	FMM-5004M	FMM-5006		
		7.35W	9.29W	29.4W	4.54W	6.8W	23.12W		
	Dimensions (W x D)	Single Size: 75 x 64 mm: FMM-5001B, FMM-5001F, FMM-5002, FMM-5004M, FMM-5006							
Physical Characteristics		Double Size: 150	x 64 mm: FMM-500	)1Q					
i nyoloar onaraotoriotioo	Weight	FMM-5001B	FMM-5001F	FMM-5001Q	FMM-5002	FMM-5004M	FMM-5006		
	Worght	/5g	/5g	90g	60g	35g	/5g		
		Operating			Non-operating				
	Temperature	0 ~ 55° C (32 ~ 1	31° F)		-40 ~ 70° C (-40 ~ 158° F)				
	Humidity	5 to 93% @ 40° (	C (non condensing)		95% @ 40° C (non-condensing)				
Environment	Shock	3G, half-sine 11m	is, each axis		18G, half-sine 11	ms, each axis			
					5 Hz to 20 Hz @	1 m2/s3 (0.01 g2 /ŀ	Iz) (flat)		
	Vibration	5 ~ 200 Hz, 0.2G, each axis			20 Hz to 200 Hz @ -3 dB/oct (slope down)				
	En incoment		1 011 0 EN000	010 0 0 0 0 0 0 0 0	95% @ 40° C (h	on-condensing)			
	Environment	ETSTEN300019-2	-1 UIASST.Z, EIN300	019-2-2 Class 2.3,	ETSI EN300019-2-	3 Glass 3. IE			
Campliance	PICING	3.0 K3.0, HPIM.1,	IKTM.U						
Compliance									
	EIVIU	FUU4/ UFK Mallo, UIASS A, UE MAIK (ENDOUZZ/ENDOUZ4/ENDUUS80)							
		Designed to meet GR TU69-UUKE							

\*Note: Type I FMMs do not include a front panel, other than the FMM-5001B.

### Compatibility

	FMM-5001B	FMM-5001F	FMM-5001Q	FMM-5002	FMM-5004M	FMM-5006
MIC-5332	Yes	Yes	-	Yes	-	Yes
MIC-5333	-	Yes	Yes	Yes	Yes	Yes
RTM-5104	-	Yes	-	Yes	-	Yes

### **Ordering Information**

Part Number	Description
FMM-5001B	10g Dual-dual star FI support
FMM-5001Q	Quad Intel 82599ES for 40G FI support
FMM-5001F	10Gb Intel 82599ES with dual SFP+ output
FMM-5004M	Mellanox CX3 for 40G FI support
FMM-5002	Server graphic with one external VGA port
FMM-5006	Intel QuickAssist Accelerator

### **Related Products**

Part Number	Description
MIC-5332 series	ATCA CPU blade with dual Intel Xeon CPU
MIC-5333 series	ATCA CPU blade with dual Intel Xeon CPU
RTM-5104 series	AdvancedTCA RTM for MIC-5332

# **RTM-5101**

#### AdvancedTCA® RTM for CPU Blade



#### **Features**

- On board SAS controller
- Supports two 2.5" SAS HDDs (Hot swappable)
- Provides external SAS / HDD failover cabling (mini SAS connectors)
- Server Graphics for Debug / Bring Up (mini PCIe daughter card, option only)
- Two 1000 Mbps rear panel ports (RJ-45 connectors)
- Two USB 2.0 rear panel ports
- One console port (mini USB connector)
- Fully managed, hot swappable RTM



#### Introduction

The RTM-5101 is a single slot (6HP) ATCA rear transition module for I/O extension of Advantech ATCA CPU blades. To meet serviceability, RTM-5101 is designed as a fully managed, and hot swappable FRU. On board SAS controller (LSI logic: LSI1064) supports two 2.5" hot swappable SAS HDDs which operates up to 3.0 Gbit/s and provides external mini SAS connectors on rear panel for failover cabling. Via USB-to-UART transceiver, frontboard UART can be exported to miniUSB connector on RTM (if frontboard UART MUX is routed accordingly.) Two Ethernet GbE ports provide extra two I/O Lans for rear access. Two USB ports (USB 2.0) support versatile USB devices (keyboard, mouse, USB stick, USB-CDROM... etc). One PCI Express x1 interface supports one mini PCIe socket for flexible expansion. Advantech provides mini PCIe VGA module (optional) for debugging purpose.



# **Specifications**

	Serial (COM)	One mini USB connector (USB slave type)		
Door Dopol Interface	Ethernet	Two 1000 Mbps ports		
nedi Fallel Illellace	USB 2.0	Two USB connectors (Type A)		
	SAS	Two hot swappable 2.5" SAS HDD bays; Two mini SAS connectors		
Internal interface	PCIe	One mini PCIe x1 socket (PS: mini PCIe VGA module is optional)		
IDMI	MMC Controller	Atmel ATMega128L		
	IPMI	Compliant with IPMI 1.5 using Pigeon Point System (PPS) Solution		
Zono 2	RTM	Advantech common RTM interface Type 1		
ZUTIE 5	Interface	Three PCIe x 4, Two SATA, Two SGMII, Two USB, 1 x U	ART, GPIO, MMC management interface	
Power Requirements		8W typical without hard drives		
		18W typical with two hard drives		
	Dimensions (W x D)	6HP, 322.25 x 94 mm (PCB size)		
Physical Characteristics		PS: 322.25 x 123.92 mm (the width to HDD's edge that extends out of rear panel)		
i njolodi ondraotonotioo	Weight	1.15 kg with two hard drives		
		0.6 kg without hard drives		
		Operating	Non-operating	
	Temperature	0 ~ 55° C (32 ~ 131° F)	-40 ~ 70° C (-40 ~ 158° F)	
Environmont	Humidity	5 to 93%@40°C (non condensing)	95% @ 40° C (non-condensing)	
LIIVIIUIIIIEIIL	Shock	3G, half-sine 11ms, each axis	18G, half-sine 11ms, each axis	
	Vibration	5 200 Hz 0.20 each avia	5 Hz to 20 Hz @ 1 m2/s3 (0.01 g2 /Hz) (flat)	
	VIDIALIOII	5 - 200 HZ, 0.20, Each axis	20 Hz to 200 Hz @ -3 dB/oct (slope down)	
Compliance	Environment	ETSI EN300019-2-1 Class1.2, EN300019-2-2 Class 2.	3, ETSI EN300019-2-3 Class 3.1E	
	PICMG	3.0 R3.0		
	FMC	FCC47 CFR Part15, Class A, CE Mark (EN55022/EN55024/EN300386)		
	LINIC	Designed to meet GR1089-Core		



### **Ordering Information**

Part Number	Description
RTM-5101-A1E	RTM Module hosts SAS controller with VGA daughter card

Note: Advantech may make changes to specification and product descriptions at any time, without notice.

#### **Related Products**

Part Number	Description
MIC-5320 series	ATCA CPU blade with single Intel Xeon CPU
MIC-5322 Series	ATCA CPU blade with dual Intel Xeon CPUs

# **RTM-5104**

#### AdvancedTCA® RTM for MIC-5332



#### **Features**

- PICMG IRTM.0 compliant
- Supports two 2.5" SAS HDDs / 4 MO-297
- Supports one Advantech Fabric Mezzanine Module
- Provides external SAS / HDD failover cabling (mini SAS connectors)
- Two 1000BASE-T or fiber rear panel ports (RJ45 / SFP connectors)
- One USB2.0 rear panel port
- Up to two serial ports
- Fully managed, hot swappable RTM



#### Introduction

The RTM-5104 is a single slot (6HP) ATCA rear transition module for I/O extension of Advantech ATCA CPU blades. To meet serviceability requirements, RTM-5104 is designed as a fully managed and hot swappable FRU. The storage tray supports up to two 2.5" SAS HDD or four MO-297A SSD's, and can be operated up to 3.0 Gbits/sec. Two external mini SAS connectors are provided on the rear panel for failover cabling as a separate part number. The RTM implements a miniUSB connector that provides a host powered USB slave port exposing a UART port of the front blade via USB. Two Ethernet GbE ports provide two additional I/O ports for rear LAN access. One USB port (USB 2.0) supports USB devices such as keyboard, mouse, USB Flash drive, or USB-CDROM.

The RTM also implements one Fabric Mezzanine Module type II socket to support flexible IO extension like 10GE ports, a server type graphics module or PCIe expressed based offload. With a PCIex16 or 2 PCIex8 gen.3 ports interfacing to the front blade, the FMM socket is not only a perfect solution for IO port extension but also custom acceleration and interafces.

#### RTM-5104SE / RTM-5104ME



#### RTM-5104NE



\*Note: This may show variant with the other SKUs, please refer to ordering information for details.

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# **Specifications**

	Serial (COM)	One mini USB connector (USB slave), RJ-45 connector	r (RS232)	
Door Donal Interface	Ethernet	Two 1000BASE-T or SFP ports		
Rear Parlet Internace	USB 2.0	One USB connector (Type A)		
	Storage	Two 2.5" SAS HDD bays or 4 MO-297A trays; optional Two mini SAS connectors		
Extension	FMM	One type II socket with PCIex16 gen.3 host interface		
IDMI	MMC Controller	Cortex M		
	IPMI	Advantech IPMI Core, compliant to IRTM.0 and IPMI 1.5/2.0		
70no 3	RTM	Advantech common RTM interface Type II		
20110-0	Interface	One PCIe x 4, One PCIe x 16, Two SAS, One USB, 2 x I	RS232, GPIO, IPMBL, MMC management interface	
Power Requirements		8W typical without hard drives and FMM		
		18W typical with two hard drives and FMM		
	Dimensions (W x D)	6HP, 322.25 x 94 mm (PCB size)		
Physical Characteristics		HDD cages protrude 30mm over rear panel		
ingerear enalacterietree	Weight	1.15 kg with two hard drives		
		0.6 kg without hard drivers		
	-	Operating	Non-operating	
	Temperature	0 ~ 55° C (32 ~ 131° F)	-40 ~ 70° C (-40 ~ 158° F)	
Environmont	Humidity	5 to 93% @ 40° C (non condensing)	95% @ 40° C (non-condensing)	
LINIOIIIIGII	Shock	3G, half-sine 11ms, each axis	18G, half-sine 11ms, each axis	
	Vibration	5 - 200 Hz, 0.2G, each axis	5 Hz to 20 Hz @ 1 m2/s3 (0.01 g2 /Hz) (flat) 20 Hz to 200 Hz @ -3 dB/oct (slope down)	
Compliance	Environment	ETSI EN300019-2-1 Class1.2, EN300019-2-2 Class 2.	3, ETSI EN300019-2-3 Class 3.1E	
	PICMG	3.0 R3.0, HPM.1, IRTM.0		
	EMC	FCC47 CFR Part15, Class A, CE Mark (EN55022/EN55024/EN300386) Designed to meet GR1089-CORE		

# **Ordering Information**

Part Number	Storage	USB	LAN	COM	FMM Support	External SAS
RTM-5104S00E	SAS x2	1	RJ45x2	miniUSB x 1	Yes	-
RTM-5104M00E*	MO-297x4	1	RJ45x2	miniUSB x 1	Yes	-
RTM-5104N00E*	SAS x2	1	SFPx2	miniUSB x1 RJ45 x1	-	mini SAS x2

\*Note: Please contact your local Advantech sales for RTM-5104M00E or RTM-5104N00E availability.

#### **Related Products**

Part Number	Description
MIC-5332 series	ATCA CPU blade with dual Intel Xeon CPU
FMM-5001FE	10Gb Intel 82599ES with dual SFP+ output
FMM-5002E	FMM-5002 with one external VGA port
FMM-5006E	FMM-5006 with Intel QuickAssist Accelerator

# ATCA-7310

# Dual CN6880 ATCA Node Blade with 40GbE Switch



#### **Features**

- Dual Cavium Octeon II CN6880 1.0 GHz with 32 cnMIPS<sup>™</sup> II processor cores
- Up to 64 GB DDR3 1066 MHz DIMMs; 32 GB for each CN6880
- 40 GbE (KR4) and four 10 GbE (KR) FI support
- Dual Star routing support
- Eight 10GbE SFP+ and four 1GbE SFP Rear I/O support
- Switch management support on L2, QoS, Multicast (SW options)

#### **Specifications**

	-	
	Processor	Dual Cavium Octeon II CN6880
	Max. Speed	1.0 GHz (option for 1.2G/300W)
	Cores Per NPU	32 cnMIPS II processor cores
Notice I. Decementary (NDU)		2 x DXAIII
Network Processor Unit (NPU)		
	Interface	
	interface	
		2 x UART
	Memory Socket	Four 240 nin VLP DIMM slots
NPU Memory	Memory Type and Capacity	FCC DDB3 1066 MHz DIMMs up to 32 GB per processor
	Processor	Freescale OorlO P1011 e500 core 800MHz
	Memory Type and Capacity	On board 32-bit DDB3 SDBAM 512 MB run at 667 MHz
	Montory Type and oupdoity	2 x SGMI
Local Mgmt. Processor (LMP)		2 x PC/a x1
	Interface	2 x 100T
		USB 2.0 (optional)
		SDHC (optional)
	Ethernet Switch	Broadcom BCM56842 for FI 40 Gb and BI 1Gb
Switch	PCIe Switch	IDT 89H16NT16G2ZBHLG
	Multiple UART Switch	PLX OXPCIe954
Deet Fleeb	Redundant Flash Type (NPU)	Dual 1Gb NOR Flash
Bool Flash	Redundant Flash Type (LMP)	Dual 1Gb NOR Flash
	Physical Connection	Advantech RTM interface
		1 x PCle x4
Zone 3 Interface (RTM)	Interface	8 x SFI
		4 x SerDes
		IPMB
	NPU Console Debug Port	2 x RJ-45 with UART I/F
	LMP Console Debug Port	1 x RJ-45 with UART I/F
I/O Front Intenace	LMP Management Port	1 x RJ-45 with 1000BASE-T
	LMP USB Port	TYPE-A USB 2.0 x 1 (optional)
	Dimensions (W x D)	6HP. 322.25 x 280.00 mm (12.69" x 11.02") (PCB size)
Physical Characteristics	Weight	2.65 kg
	Bootloader	U Boot
014/0	HW Mgmt	IPMI 1.5 / PIGMG3.0 Revision 3.0
Sw Support	Switch Mamt	Broadcom FastPath 6.2
	Operating System	WindRiver Linux 4.2
	Operating Environment	Temperature: 0 to 40° C
Faulterment	Operating Environment	Humidity: 20% to 90 % RH
Environment	Charge Tamparahura	Temperature: -20 to 70° C
	Storage Temperatures	Humidity: 5% to 95 % RH
Compliance	EMC/Safety	CE/ FCC/ CB (planned)

### **Ordering Information**

Part Number ATCA-7310 Description
Dual CN6880 ATCA Node Board with 40GbE Switch

# ATCA-9112

#### 40 GbE Switch Blade Supports Up to 16 Slots



#### **Features**

- PICMG 3.0/3.1 compliant AdvancedTCA<sup>®</sup>
- Supports up to 16-slot platforms
- Separate base and fabric interface switching to provide enhanced security and protection
- 10/40G fabric interface with eight 10GE uplinks
- Fabric interface bandwidth up to 640G
- 1/10G basic interface with two GE uplinks
- Basic interface bandwidth up to 64G
- One AMC slot

### **Specifications**

	Processor	Freescale QorlQ P1011
	E500 Core Frequency	800 MHz
Local Mart Processor	Memory Type and Capacity	Unbuffered 2Gb DDR3 1333 MHz
(IMD)		Two SGMII interface
	Interface	PCIe x1 interface
	IIIeilace	USB 2.0 interface
		SDHC interface
	Ethernet Switch	Broadcom BCM56846 for 40Gb & 10G
Switch	Management Switch	Broadcom BCM56321 for 10Gb & 1Gb
	PCIe Switch	PLX PEX8614
Boot Flash	Redundant Flash Type (LMP)	Parallel NOR Flash 128MB TSOP56
		1 x XAUI
AMC	Interface	SAS
		PCIe x4
	Physical Connection	Advantech RTM interface
Zone 3 Interface (RTM)		PCIex4
	Interface	SAS/SAIA
	LMD Ormania Dahur Dart	
	LIVIP CONSOLE DEDUG POR	I X KJ-45
I/O Front Interface	LMP USB Port	
	SFP+ Port	10 x SFP+
	Ethernet Management Port	KJ-45 10/100/1000BI
Physical Characteristics	Dimensions (W x D)	6HP, 322.25 x 280.00 mm (12.69" x 11.02") (PCB size)
	Weight	3.0 kg (Est.)
	Bootloader	U-Boot
SW Support	HW Mgmt	IPMI 1.5 / AICA Revision 3.0
on oupport	Switch Mgmt	Broadcom FASTPATH 6.3.1
	Operating System	WindRiver Linux 4.0
	Operating Environment	Temperature: 0 to 40° C
Environment		Humidity: 20% to 90 % KH
Little officient	Storage Temperatures	Iemperature: -20 to 70° C
0	51000	HUMIOITY: 5% TO 95 % KH
Compliance	EIMU/Satety	CE/ FCC/ UL/CB (planned)

#### **Ordering Information**

Part Number	Description
ATCA-9112	40GbE ATCA Switch Blade

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# **DSPA-8901**

#### AdvancedTCA<sup>®</sup> DSP Blade Provides Industry's Most Powerful DSP Farm for Voice and Video Processing



#### Features

- Twenty Texas Instruments TMS320C6678 DSPs
- 512 MB ~ 2 GB DDR3 memory per DSP
- BCM56321 10 GbE switch for both Fabric Interface and Base Interface
- Freescale QorIQ<sup>TM</sup> P2020 for Local Management Processor (LMP)
- IDT Tsi577 Serial RapidIO switches
- Pigeon Point System IPMI 2.0
- Wind River Linux PNE-LE 4.0 support for P2020
- Single slot PICMG 3.0/ 3.1 compliant

#### Introduction

The DSPA-8901 is designed with 20 TI TMS320C6678 DSPs. With its twenty onboard TMS320C6678 DSPs at 1.0 GHz core frequency, the DSPA-8901 provides 160 cores of processing power to reach the higher levels of performance density needed to build the highest capacity wireless media gateways. The DSPA-8901 significantly reduces overall system power dissipation and system cost, and frees up valuable slots in gateway elements for additional subscriber capacity and throughput. The DSPA-8901 includes a high-performance Freescale QorIQ P2020 processor. The powerful Broadcom BCM56321 switch terminates the 10 gigabit Ethernet fabric connections and distributes traffic to the twenty DSPs. The DSPA-8901 offers unrivaled packet and media processing capabilities.

For increasing demand in high end video conferencing, broadcasting and telepresence fields, the DSPA-8901 ATCA blade also offers unrivaled image processing performance for compression and decompression, image analysis, filtering and format conversion.

#### **Specifications**

	DSP	TI TMS320C6678
	Number of DSPs	20
	Speed of DSP	1.0 GHz
DSP Farm	Cores per DSP	8 x TMS320C66x DSP @ 1.0 GHz
	DDR3 Memory per DSP	512 MB ~ 2 GB
	Interface	Serial RapidIO interface
	Interlace	1000 Mbps Ethernet with SGMII
70		1 x Broadcom BCM56321 10 GbE switch
Zone 2	Fabric Interface/Base Interface	2 X 10 GDE XAUI TOF TADFIC INTERTACE 2 x 1000 Mbps for base interface
Serial BanidIO	Serial BanidIO Switch	2 x Tundra/IDT Tsi577 (16-port 3 125 Gh Sarial BanidIO switch)
	Processor	2 × fundra b f ison (10 por 5.25 db Schar hapido Switch)
	F500 Core Frequency	In to 12 GHz
	DDR3 Memory	2 GR 1 x 128 M*8 1 G 1333 MHz (ECC)
	Dens wentery	Sarial Ranidla interface
1		10/10/1000Mbs Ethernet interfaces
Local Management Processor (LIMP)	Interface	PCIe interface
		USB 2.0 interface
	Root Flach	Dual boot flashes (redundancy)
	DUULTIASII	Redundant pair of 128 MB
	Local Bus	1 x NAND Flash up to 1 GB
	Console Port	1 x RJ-45 (UART)
Front I/O Interface	USB Port	1 х Туре А
	Ethernet Management Port	1 x RJ-45
	DSP Status	Per DSP Dual Color RED/GREEN DSP status (20 total LEDs)
Front LEDs	Health Status	Green
TION LEDS	Out of Service	Red/Yellow
	ATCA Hot Swap	Blue
Power	Watt	Max. 350 W
Cooling	Heatsink	Passive Aluminum Cooler
	Boot Loader	U-Boot
Software Support	H/W Management	Compliant with Pigeon Point System IPMI 2.0
	Operating System	WindRiver Linux PNE-LE 4.0/Freescale SDK
Physical Characteristics	Dimensions (W x D)	322.25 x 294.56 mm (12.69" x 11.60")
	Weight	3 kg
Environment	Operating Environment	Temperature: 0 to 45° C, Humidity: 20% to 90 % RH
Littinonit	Storage Temperature	Temperature: -20 to 70° C, Humidity: 5% to 95 % RH
	FM0/0-(-)	CE mark (EN60950-2001)
Compliance	EMIC/Safety	ULDU95U-1/USAUZZZ ECC47_CED_Dat15_Class_A_55029/ENI55024/ENI200206
,	DICMC	0.001 UFN FAILTS, UIASS A 30022/EIN00024/EIN00000
	FIGINIQ	3.0/3.1

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#### **DSPA-8901**





### **Ordering Information**

Part Number	Description
DSPA-8901E	AdvancedTCA TI TMS320C6678 DSP Blade w/ 32-bit memory for Voice and Video Processing

# **MIC-5203**

#### Advanced Mezzanine Card Quad Gigabit Ethernet AMC



#### **Features**

- Intel® i350 Quad Port Gigabit Ethernet Controller
- PCIe x4 Gen.2 host interface
- Quad SFP or RJ-45 connectors
- Compliant with AMC.0 R1.0, AMC.0 R2.0, AMC.1 R2.0 and IPMI v1.5 specifications

#### Introduction

The MIC-5203 is a low power, quad-port GbE AMC, with copper RJ-45 or fiber SFP pluggable modules. It incorporates the Intel<sup>®</sup> i350 Quad Gigabit Ethernet controller. The AMC provides a high performance PCIe x4 interface at 5 Gb/s per lane at an outstanding low power dissipation of less than 10W. Support for Intel's offloading and platform enhancement features yields maximum network throughput while preserving valuable CPU cycles for application processing.

The MIC-5203 features an Intel<sup>®</sup> i350 which provides Intel<sup>®</sup> Virtualization Technology for Connectivity (VT-c) and Virtual Machine Device Queues (VMDq), helping to reduce I/O bottlenecks, boost throughput, and reduce latency. Where virtualization is required, VMDq improves performance by offloading the data-sorting burden from the virtual machine manager (VMM) to the network controller. The MIC-5203's specialized features include VLAN tagging, stripping and packet filtering; iSCSI, UDP, TCP and IP Checksum offload.

For a maximum of interoperability, the MIC-5203 supports a PClex4 (AMC Ports 4..7) host interface. The PCle reference clock can be supplied over FLCKA or an onboard oscillator for systems which do not supply a PCle reference clock. The MIC-5203 is compliant with both AMC.0 R1.0 and R2.0 specifications.

#### **Specifications**

	Controllor	Intal i250 guad ChE MAC /DUV	
	CONTROLLER	IIIIEI ISSU QUAU ODE IVIAO/FITT	
	Virtualization technologies	VMDq, VI-c	
Controller	IP	IPv4, IPv6	
	Queues	8RX, 8TX per port	
	Offloading	TCP, UDP, SCTP	
10	LEDs	AMC FRU LEDs, Network Link, Activity and Speed	
Software	Operating Systems	Linux, Windows	
	Boot	PXE, iSCSI	
Power Pequirement		SFP	RJ-45
	Consumption	8.5W (w/o FOTs)	5.5W
Environment		Operating	Non-Operating
	Temperature	0 ~ 55° C (32~131° F)*	-40 ~ 70° C (-40 ~ 158° F)
	Humidity	95 % @ 40° C, non-condensing	95 %@ 60° C, non-condensing
Dhygiaal Characteristics	Dimensions (W x D)	180.6 x 73.5 mm; mid-size, single-width**	
FIIYSIGAI GIIAIAGUEIISUGS	Weight	0.128 kg (0.28 lbs)	
Compliance	AMC.0 R1.0, AMC.0 R2.0, AMC.	1 R2.0 and IPMI v1.5	

\*Note: Operating temperature depends on actual air flow through the AMC slot.

\*\*Note: Full-size front panel available on request. Pls contact your Advantech sales representative.

#### **Ordering Information**

Part Number	Description
MIC-5203-AE	Mid-size GbE AMC with quad SFP interfaces
MIC-5203-BE	Mid-size GbE AMC with quad RJ-45 interfaces

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#### Advanced Mezzanine Card Dual 10 Gigabit Ethernet AMC



#### **Features**

- Intel® 82599 Dual Port 10 Gigabit Ethernet Controller
- PCIe x8 Gen.2 host interface
- Dual SFP+ connectors
- Compliant with AMC.0 R1.0, AMC.0 R2.0, AMC.1 R2.0 and IPMI v1.5 specifications

#### Introduction

The MIC-5212 is a low power, dual-port 10 GbE AMC, with SFP+ pluggable modules for multi-mode and single-mode fiber media and is based on the Intel<sup>®</sup> 82599ES 10 Gigabit Ethernet controller. The AMC provides a high performance PCIe x8 interface at 5 Gb/s per lane at an outstanding low power dissipation of less than 10W. Support for Intel's offloading and platform enhancement features yields maximum network throughput while preserving valuable CPU cycles for application processing.

The MIC-5212 features an Intel®82599 which provides Intel® Virtualization Technology for Connectivity (VT-c) including Virtual Machine Device Queues (VMDq) and PCI-SIG compliant Single Root I/O Virtualization (SR-IOV), helping to reduce I/O bottlenecks, boost throughput, and reduce latency. Where virtualization is required, VMDq improves performance by offloading the data-sorting burden from the virtual machine manager (VMM) to the network controller. The MIC-5212's specialized features include Layer 2 & 3 security with IPSec & LinkSec; VLAN tagging, stripping and packet filtering; and TCP, iSCSI, and Fiber Channel over Ethernet (FCoE) offload.

For a maximum of interoperability, the MIC-5212 supports a PClex4 (AMC Ports 4..7) or PClex8 (AMC ports 4..11) host interface. The PCle reference clock can be supplied over FLCKA or an onboard oscillator for systems which do not supply a PCle reference clock. The MIC-5212 is compliant with both AMC.0 R1.0 and R2.0 specifications.

#### **Specifications**

	Controller	Intel 82599ES dual 10GbE MAC/PHY		
	Virtualization technologies	VMDq, VMDc, SR-IOV		
	IP	IPv4, IPv6		
Controller	Queues	128RX, 128TX per port		
	Offloading	TCP, UDP, SCTP, FCoE		
	Security acceleration	Linksec IEEE802.1ae (AES-128 Authorization/Encryptic IPSec (AES-128, 1024 SA's)	on)	
10	SFP+	2 sites with support for presence detection, status and ID EEPROM		
	LEDs	AMC FRU LEDs, Network Link and Activity		
Coffuero	Operating Systems	Linux, Windows		
SUILWAIE	Boot	PXE, iSCSI		
	Power Consumption	Payload Power (12V)	Management Power (3.3V)	
Power	Does not include FOT transceivers	0.75A max	0.15A max	
Environment		Operating	Non-Operating	
	Temperature	0 ~ 55° C (32 ~ 131° F)*	-40 ~ 70° C (-40 ~ 158° F)	
	Humidity	95 % @ 40° C, non-condensing	95 % @ 60° C, non-condensing	
Physical Characteristics	Dimensions (W x D)	180.6 x 73.5 mm; mid-size, single-width**		
	Weight	0.124 kg (0.27 lbs)		
Compliance	AMC.0 R1.0, AMC.0 R2.0, AMC.1	R2.0 and IPMI v1.5		

\*Note: Operating temperature depends on actual air flow through the AMC slot.

\*\*Note: Full-size front panel available on request. PIs contact your Advantech sales representative.

#### Ordering Information

Part Number	Description
MIC-5212-AE	Mid-size 10GbE AMC with dual SFP+ interfaces

# **MIC-5401**

#### Advanced Mezzanine Card SAS/SATA Storage AMC



#### Features

- Single-width mid-size AMC form factor
- SAS or SATA 2.5" hard disk drive compatible
- Hot-swap capable
- AdvancedTCA and MicroTCA compatible
- Dual port SAS drive support
- 3.0 Gb/s interface speed support
- Two thermal sensors to monitor on-board temperatures
- System management compliant to PICMG3.0 R2.0, AMC.0 R2.0, AMC.3 R1.0, and IPMI1.5
- Power-on hour counter
- HPM.1 compliant firmware upgrade and rollback support through IPMB



#### Introduction

The Advantech MIC-5401 is a single-width/mid-size Advanced Mezzanine Card (AMC) designed to support a 2.5" SAS or SATA hard disk drive to work as an enterprise storage module on an ATCA platform or in a MicroTCA shelf. The 2.5" hard disk drive is connected to the AMC port 2 (SAS and SATA) and port 3 (SAS only) according to the AMC.3 specifications. Dual port SAS drives may be used on the MIC-5401 to increase the interface bandwidth of failover support between dual hosts in fault tolerant environments. Like all other standard AMC modules, an IPMI-based module management controller (MMC) is also implemented on the MIC-5401 to serve as a communication interface to the Carrier Management Controller on an ATCA platform, or to the MicroTCA Carrier Management Controller on the MicroTCA Carrier Hub in a MicroTCA shelf. As a local IPMI controller on the AMC, it manages all hot-swap activities, E-keying, and hardware heath monitoring such as voltages (12V, 5V, and management power 3.3V) and on-board temperatures (including hard disk drive's ambient temperature). The MIC-5401's mechanical design is optimized for a maximum of shock and vibration durability combined with a user- and service friendly mounting process for the disk drive.

### **Specifications**

AMC Module	Single width, mid-size form factor (full-size front panel available as an option)		
Storage Device Supported	2.5" SAS or SATA hard disk drives, or 2.5" SATA SSD (solid state drive)		
System Management	PICMG 3.0 R2.0, AMC.0 R2.0, and IPMI 1.5 compliant		
System Management	Redundant firmware images based on Pigeon Point Systems' solution supporting HPM.1 compliant upgrades and manual/automatic rollback		
	Power-on hour counter		
Monitor	Voltage: 12 V, 5 V, and 3.3 V management power		
	Temperature: two on-board locations		
Watchdog	AMC compliant watchdog		
Thermal Sensor	LM75/DS75 (x2)		
	Temperature and humidity (operating)	GR-63-Core, Issue 3, R4-7 (-5° C ~ 55° C; 5% ~ 95%RH)	
	Temperature and humidity (non-operating)	GR-63-Core, Issue 3, R4-7 (-40° C ~ 70° C; 95%RH)	
Environmental Conditions	Altitude	GR-63-Core, Issue 3, R4-8, R4-9, R4-10, R4-11, R4-12 (-60 m ~ 4000 m)	
	Vibration (operating)	IEC 60068-2-64 (0.002G <sup>2</sup> /Hz, 1 Grms, 5 ~ 500 Hz)	
	Vibration (non-operating)	IEC 60068-2-6 (2 G, 5 ~ 500 Hz, 1 Octave/min)	
	Shock (operating)	IEC 60068-2-27 (half-Sine, 10 G, 11 ms)	
	Shock (non-operating)	IEC 60068-2-27 (half-Sine, 30 G, 11 ms)	
Populatory	Conformance	UL94V0, FCC Class B, CE, RoHS & WEEE compliant	
negulatory	NEBS Level 3	Designed for GR-63-Core and GR-1089-Core	
Compliance	Standards	PICMG 3.0 R2.0, AMC.0 R2.0, AMC.3 R1.0, IPMI1.5, and SCOPE AdvancedMC Hardware Profile V1.0	

#### **MIC-5401**



## **Ordering Information**

Part Number	Description
MIC-5401-0000E	Mid-size

Note:

1. AMC modules with pre-installed hard disk or solid state disk drives are available on request. Please contact Advantech sales representative for further detail.

2. Full size front panel is available on request.
# Advanced Mezzanine Card Intel<sup>®</sup> 45 nm Core<sup>™</sup>2 Duo Processor AMC



#### **Features**

- Supports Intel<sup>®</sup> 45 nm Core<sup>™</sup>2 Duo Low Voltage processor
- Intel<sup>®</sup> 3100 chipset 400/533 MHz FSB
- Up to 4 GB DDRII 400 MHz SDRAM with ECC
- One Gigabit Ethernet (RJ-45), one USB 2.0 port, and one console port (mini-USB) to front panel
- AMC connector routes dual Gigabit Ethernet SerDes (x2), SATA (x2), USB (x2), dual PCle x4, or single PCle x8
- Boot from network, CompactFlash, SATA, USB
- Supports IPMI v1.5 and Serial-over-LAN function
- AMC.0, AMC.1, AMC.2 and AMC.3 compliant



### Introduction

The MIC-5602Rev2 is a highly integrated single-width, full-size, processor AMC. Its design is based on the low-power, high-performance 45nm Intel<sup>®</sup> Core™2 Duo processors combined with the Intel® 3100 chipset. The board includes 2 or 4 GB of soldered DDR2 400 MHz memory with ECC for higher MTBF and optimum cooling. To facilitate development, test and integration while offering typical network connectivity once deployed, the front panel provides a gigabit Ethernet connector, a serial port and a USB 2.0 host port.

The board can be configured with two PCI Express x4 ports or a single PCI Express x8 port to the edge connector. Two gigabit Ethernet ports provide AMC.2 compliance and connect to the 3100 chipset via PCI Express for maximum data throughput. Dual SATA interfaces provide AMC.3-compliant storage and two USB ports offer further connectivity opportunities. A dedicated Module Management Controller (MMC) monitors onboard conditions and manages hot swap operation for field upgrades or module replacement without the need to power down the underlying system.

While maintaining the functional features of the original MIC-5602, the Rev2 series offers a significant performance increase and memory size upgrade for applications such as dense computing, host media processing and protocol offload.

## **Specifications**

	CPU	Intel Core 2 Duo SL9380 (1.8 GHz)
Processor System	Chipset	Intel 3100
	DIOC	AMI (1. Dual images with update rollback, 2. CMOS settings can be changed over IPMI, and 3. CMOS backup works
	DIUS	without battery)
Rus	Front Side Bus	800 MHz
Dus	PCI Express	PCI Express rev1.0a : one x8 and two x4 routed to AMC connector
Memory	Technology	DDRII 400 with ECC
INIGITIOI Y	Max. Capacity	4 GB
Ethornot	Controller	Intel 82571EB dual-port Gigabit Ethernet controller (support 802.3d compliant link aggregation)
LINGINGI	Interface	One GbE accessible on front panel via RJ-45 and two SerDes links to AMC common options region ports 0 and 1
Mass Storage	CompactFlash	Optional expansion board with CF type-1 socket
SATA Interface	AMC Edge Connector	Two SATA interfaces to common ports region 2-3
	Other	One SATA routed to CF daughter board
Serial Interface	I/O	Routed to front panel as USB Slave interface through onboard USB to Serial converter
LISB Interface	I/O	One USB 2.0 compliant host port (standard USB Connector) on front panel
	AMC Edge Connector	Two USB 2.0 ports connect to rear AMC edge connector
Watchdog Timer		AMC compliant watchdog
Hardware Monitor	Controller	IPMI v1.5 compatible MMC
Firmware	Source Code	Pigeon Point System-based
TITTWALC	Update Standard	HPM.1 compliant
Operating System	Compatibility	Carrier Grade Linux (Wind River Platform for Network Equipment, Linux Edition 2.0)
Form Factor	AMC	Single size, single width (full size front panel and full size CPU heatsink available as option)
I UIIII I AGLUI	Interface	AMC.0 compliant
Miscellaneous	LEDs	x1 blue for hot swap, x1 red/amber for failure and OOS, x1 green for general purpose
Power Requirement	Configuration	Core2 Duo SL9380 + 3100 + 2 GB on-board DDRII SDRAM
	Consumption	estimated 38.5 watts
Physical Characteristics	aracteristics Dimensions (W x D) 180.6 x 73.5 mm	

#### MIC-5602Rev2



Environment		Operating	Non-operating
	Temperature	-5 ~ 55° C (23 ~ 122° F) Note 4	-40 ~ 70° C (-40 ~ 140° F)
	Humidity	IEC60068-2-78 (95%RH @ 40° C)	
	Vibration (5 ~ 500 Hz)	IEC60068-2-6 ( 0.002G2/Hz, 1Grms)	
	Shock	IEC60068-2-27 (10G, 11ms)	
	Altitude	sea level to 4,000 m above sea level	10,000 above sea level
Regulatory	Conformance	UL94V0, FCC Class B, CE, RoHS & WEEE Ready	
	NEBS Level 3	Designed for GR-63-Core and GR-1089-Core	
Compliance	Standards	PICMG AMC.0, AMC.1, AMC.2, AMC.3, IPMI v1.5, HPM.1	

## **Ordering Information**

Dort Number	On-Board Option				
Fart Nulliber	CPU	Memory			
MIC-5602A2-M2E	Core 2 Duo LV 1.8 GHz (SL9380)	2 GB DDR2 with ECC			
MIC-5602A2-M4E	Core 2 Duo LV 1.8 GHz (SL9380)	4 GB DDR2 with ECC			

Note:

1. TPM option is available on request.

2. CF module option is available as standard configuration.

 MIC-5602A2-M4E builds will depend on the availability of the 4 GB DDR2 SDRAM from the manufacturers. Check with your local Advantech sales ahead of time for information.
Operating Temperature: depending on the actual air flow through the AMC slot.



MIC-5602A2-M2E with Full-Size Front Panel

## Advanced Mezzanine Card based on 3rd Generation Intel® Core<sup>TM</sup> Processors with ECC



#### **Features**

- Supports 3rd or 2nd Generation Intel® Core™ Processor family
- Intel<sup>®</sup> QM67 PCH chipset with KVM over LAN
- Up to 8 GB (DDR3 1066/1333/1600 MHz) soldered SDRAM with ECC
- Two Gigabit Ethernet (RJ-45), one USB 2.0 (or two for full-size sku), one console (micro-USB), and one HDMI Type D (or Type A for full-size sku) to front panel
- AMC connector routes Gigabit Ethernet (x2), SATA 3.0 (x2), PCIe x4
- Dual XAUI, SRIO, PCIe or custom fabrics on fat pipes with optional AMC fabric mezzanine
- Boot from network, onboard flash, CFast card or external devices
- Supports IPMI v1.5 and Serial-over-LAN function
- AMC.0, AMC.1, AMC.2, and AMC.3 compliant



#### Introduction

The Advantech MIC-5603 is a single-width mid-size or full-size general purpose processor AMC module for ATCA or MicroTCA applications. Its design is based on 3rd generation Intel<sup>®</sup> Core<sup>™</sup> processors in a BGA package combined with the Intel<sup>®</sup> QM67 chipset. This AMC module supports processors with integrated memory and graphics controllers, and a maximum L3 cache of 4MB. It can support up to 8 GB, dual-channel, on-board DDR3 memory with ECC at 1600 MHz, making it ideal for mission critical applications requiring low latency and reliable memory access. For graphics or control applications the front panel HDMI port provides support for the processor's integrated Intel<sup>®</sup> HD 4000 graphics controller with DirectX v11, along with OpenGL v3.1 and OpenCL v1.1 capabilities.

As standard feature, external Ethernet connectivity is provided on two dedicated GbE front panel ports, one each from the Intel® QM67 PCH and the onboard Intel® 82580 quad port LAN controller, which also provides two additional GbE ports to the AMC base fabric. The Intel® PCH brings new and enhanced remote management capabilities with KVM over LAN as well as introducing faster I/O than previous generation designs with SATA-III to AMC ports 2..3 and PCIe x4 gen.2 to ports 4..7. This module can also be configured to boot from the network, local CFast compact flash or flash disk, or external storage media such as HDD or USB drives.

To enable maximum application flexibility, the MIC-5603 is not only designed to support PICMG AMC sub-specifications such as AMC.1/.2/.3, it also has a fabric expansion mezzanine interface that allows the implementation of standard or customized mezzanine modules that offer enhanced fat pipe connectivity and I/O support. For example, the fabric expansion mezzanine can implement an Intel® 82599 controller offering dual 10 GbE to the fat pipes or a PCIe-to-SRIO bridge or any other type of PCIe device for tailored connectivity to ports 8..11 and 17..20. A dedicated Module Management Controller (MMC) monitors onboard conditions and manages hot swap operation, module replacement and field upgrades without the need to power down the carrier system.

## **Specifications**

	CPU	Intel 3rd Generation Core i7 mobile processors up to 2.5 GHz (4 MB L3 cache)
Processor System	Max. Speed	3.2 GHz (turbo boost frequency with 1 core)
	PCH	Intel QM67
	RIOS	UEFI BIOS based on AMI
	000	(1. Redundant flash with HPM.1 update & rollback, 2. Configuration settings can be changed over IPMI)
Bus	DMI	5.0 GT/s point-to-point DMI interface to PCH
Memory	Technology	Dual channel DDR3 1066MT/s, 1333MT/s, and 1600MT/s SDRAM with ECC.
Wichtory	Max. Capacity	8 GB RAM (soldered on-board memory)
Ethernet	Controllers	Intel 82580EB Quad-port Gigabit Ethernet controller
Linemet	Interface	Two GbE accessible on front panel via RJ-45 and two SerDes links to AMC ports 0 and 1
	Serial (COM)	One x86 Serial Port
Front I/O Interface		(USB slave connector through onboard USB to Serial converter)
Tront i/O michaec	Ethernet	Two 10/100/1000BASE-T through PCIe based Intel 82580 & 82579 MAC/PHY
	USB 2.0	One port (Type A)
Mass Storage	CFast	Mezzanine Module with CFast socket (NOTE 1)
Wass Storage	Onboard	8 GB (standard) or 16 GB (optional) industrial grade internal SATA flash disk
SATA		
Interfaces	AMC edge connector	Two SATA interfaces (6Gbps) to common option ports 23
	Other	One SATA routed to CF daughter board (optional)
Operating System	Compatibility	WindRiver PNE-LE 3.0, RHEL, CentOS, Windows Server 2008, Windows 7 Enterprise
System Management	MMC	NXP LPC1768
Cystom Managomont	IPMI Compliancy	IPMI 1.5 with IPMI 2.0 features (e.g. RMCP, SOL) using Advantech IPMI Core
Watchdog Timer	Supervision	One MMC watchdog, One payload watchdog
Watehoog Timer	Interval	IPMI compliant
Miscellaneous	LEDs	x1 blue for hot swap, x1 red/amber for failure and OOS, x1 green for general purpose
Compliance	Standards	PICMG AMC.0, AMC.1, AMC.2, AMC.3, IPMI v1.5, HPM.1

AD\ANTECH All product specifications are subject to change without notice



## **Specifications (Cont.)**

Power Consumption	Configuration	Intel Core i7-3555LE + QM67 + 8GB on-board DDR-III	memory
	TDP (Estimated)	40W max.	
Physical Characteristics	Dimensions (W x D)	Mid-size (or Full-size), 180.6 x 73.5 mm	
		Operating	Non-operating
	Temperature	-5 ~ 55° C (23 ~ 131° F) (NOTE 2)	-40 ~ 70° C (-40 ~ 158° F)
Environmont	Humidity	IEC60068-2-78 (95%RH @ 40° C)	
EIIVII UIIIIIEIIL	Vibration (5 ~ 500Hz)	IEC60068-2-6 (0.002G2/Hz, 1Grms)	
Regulatory	Shock	IEC60068-2-27 (10G, 11ms)	
	Altitude	4,000m above sea level	10,000m above sea level
	Conformance	UL94V0, FCC Class B, CE, RoHS & WEEE Ready	
	NEBS Level 3	Designed for GR-63-Core and GR-1089-Core	

## **Ordering Information**

Part Number (NOTE3, NOTE4)	Description
MIC-5603A2FZ-M4E	Full-size front panel, Intel i7-3555LE, 4GB DDR3 with ECC, AMC Mezzanine Module with 8 GB on-board flash
MIC-5603A2FZ-M8E	Full-size front panel, Intel i7-3555LE, 8GB DDR3 with ECC, AMC Mezzanine Module with 8 GB on-board flash
MIC-5603A2M-M4E	Mid-size front panel, Intel i7-3555LE, 4GB DDR3 with ECC, CFast module with 8 GB on-board flash
MIC-5603A2M-M8E	Mid-size front panel, Intel i7-3555LE, 8GB DDR3 with ECC, CFast module with 8 GB on-board flash
MIC-5603AFZ-M4E	Full-size front panel, Intel i7-2655LE, 4GB DDR3 with ECC, AMC Mezzanine Module with 8 GB on-board flash
MIC-5603AFZ-M8E	Full-size front panel, Intel i7-2655LE, 8GB DDR3 with ECC, AMC Mezzanine Module with 8 GB on-board flash
MIC-5603AM-M4E	Mid-size front panel, Intel i7-2655LE, 4GB DDR3 with ECC, CFast module with 8 GB on-board flash
MIC-5603AM-M8E	Mid-size front panel, Intel i7-2655LE, 8GB DDR3 with ECC, CFast module with 8 GB on-board flash

Where Z stands for fabric expansion mezzanine module option (Z = X for XAUI, Z= S for SRIO, Z = R for SAS RAID).

Note: 1. CFast module, available on the mid-size sku as default, and the AMC Mezzanine Module are mutually exclusive. For 16 GB on-board flash, please contact your local Advantech sales.

2. Operating Temperature: depending on the actual air flow through the AMC slot.

3. For lower or higher on-board memory support, please contact your local Advantech sales for options.

4. For the Intel Core i7-3517UE or i7-2610EU support, please contact your local Advantech sales.

#### Advanced Mezzanine Card Freescale QorlQ P4080 AMC



#### **Features**

- Freescale P4080 8-core e500-mc PowerPC, up to 1.5 GHz
- DDR3 up to 1333 MHz 8 GB with ECC support
- 4 MB SPI Flash and 2 GB NAND Flash
- One 10 GbE SFP+ port for external access
- AMC.0, AMC.1, AMC.2, and AMC.4 compliant and configurable SERDES channel (PCIe/SGMII/XAUI/SRIO) support
- Efficient power consumption, typical 32W
- 8 KHz and 19.44 MHz Telecom Clock Sync support



#### Introduction

The AMC-4201 is a single-width, mid-size AMC based on the Freescale P4080 processor. It combines eight Power Architecture<sup>®</sup> e500-mc Cores operating at frequencies up to 1.5 GHz with high-performance, datapath acceleration logic, extensive networking I/O, and peripheral bus interfaces. It combines powerful multi-Core Power Architecture performance with network processing capabilities, and builds on the communications ubiquity of Freescale's QorIQ<sup>®</sup> product family. AMC-4201 provides 4 and 8 GB build options for onboard DDR3 memory at 1333 MHz with ECC support. One front-panel 10GbE SFP+ connector provides network access in addition to a front panel console and debug port.

The unique SERDES design supports up to four different AMC port configurations for a mix of SRIO, PCIe, XAUI and SGMII channels. This makes the AMC extremely versatile and caters to a wider range of MicroTCA or ATCA Carrier topologies beyond just telecom applications. 4 MB SPI Flash and 2 GB NAND Flash provide onboard options for software and storage. The AMC also provides 8 KHz and 19.44 MHz telecom clock synchronization support.

## **Main Carrier Board Specifications**

Dragonar aveter	CPU	Freescale QorIQ P4080 8-core e500-mc PowerPC, up 1	to 1.5 GHz		
110063301 39316111	Bootloader	U-boot			
De et Device	SPI Flash	Spansion S25FL032P0XMFI011, 4 MB			
BOOL Device	NAND Flash	SamSung K9WAG08U1D-SCB0000, 2 GB			
Momony	Technology	DDR III with ECC, up to 1333 MHz			
wernory	Max. Capacity	8 GB			
Ethorpot	Controller	Netlogic AEL1010			
Ethernet	Interface	One 10 GbE SFP+ port for external access			
Hardware Monitor	Controller	IPMI v1.5 compatible MMC			
Firmwara	Source code	Pigeon Point System-based			
FIIIIWale	Update Standard	HPM.1 compliant			
Operation System	Compatibility	WindRiver Linux 4.3			
Operation System	Companying	Freescale DPAA SDK1.0 (Optional)			
Form Factor	AMC	Mid-size, single width			
	Interface	AMC.0 compliant and Configurable SERDES channel support: - PCIe: AMC.1 compliant with port 4-7, 8-11 - Ethernet: AMC.2 compliant with port 8-11 - XAUI: AMC.2 compliant with port 8-11 - SRI0: AMC.4 compliant with port 4-7, 8-11			
Dower Consumption	Max	40 W			
Power Consumption	Typical	Less than 32 W			
Physical Characteristics	Dimensions (W x D)	180.6 x 73.5 mm			
		Operating	Storage		
	Temperature	-5 ~ 55° C	-40 ~ 70° C		
Environmont	Humidity	IEC60068-2-78 (95%RH @ 40° C)			
EIIVII UIIIIIIEIII	Vibration	IEC60068-2-6 (0.002 G2/Hz, 1Grms)			
	Shock	IEC60068-2-27 (10 G, 11 ms)			
	Altitude	300 m below sea level to 4,000 m above sea level	10,000 above sea level		
Regulatory	Conformance	FCC Class B, CE, RoHS & WEEE (Plan)			
Compliance	Standards	PICMG AMC.0, AMC.1, AMC.2, AMC.4, IPMI v1.5, HF	PM.1, NEBS Level 3(Design compliant)		



## **Ordering Information**

Part Number	Description
AMC-4201-11AE	AMC-4201 with P4080-1.5 GHz and 4 GB DDR3-1333 MHz memory (PCIe as port 4-7, 4x SGMII as port 8-11)
AMC-4201-12AE	AMC-4201 with P4080-1.5 GHz and 4 GB DDR3-1333 MHz memory (PCIe as port 4-7, PCIe as port 8-11)
AMC-4201-13AE	AMC-4201 with P4080-1.5 GHz and 4 GB DDR3-1333 MHz memory (SRIO as port 4-7, SRIO as port 8-11)

Contact our sales for more pricing & ordering information.

Note:

1. 1G or 10G front panel is available on request.

2. 8GB DDR3 is available on request.

3. XAUI as port 8-11 is available on request.

#### Advanced Mezzanine Card Freescale QorIQ P5020 AMC



#### **Features**

- Freescale P5020 2-core 64bit e5500 PowerPC, up to 2.0 GHz
- Up to DDR3 1333 MHz 8 GB with ECC support
- 4 MB SPI Flash and 2 GB NAND Flash
- 1 GbE/10 GbE capability for external access
- AMC.0/.1/.2/.3/.4 compliant
- Optional SerDes Lane (PCIe/SGMII/SRIO)
- Two SATA interface
- Efficient power consumption, typical 32 W
- Clock Sync support 8KHz and 19.44 MHz



### Introduction

The AMC-4202 is a single-width, mid-size AMC based on the Freescale P5020 processor. It combines two 64-bit ISA Power Architecture™ processor cores with high-performance datapath acceleration logic and network and peripheral bus interfaces required for networking, telecommunications, and wireless infrastructure. The P5020 can be used for control processing in applications such as routers, switches, internet access devices, firewall and other packet filtering processors, network attached storage, storage area networks, imaging and general-purpose embedded computing. Its high level of integration offers significant performance benefits and greatly helps to simplify board design. AMC-4202 provides 4 and 8 GB build options for onboard DDR3 memory at 1333 MHz with ECC support. One front-panel 10GbE SFP+ connector provides network access in addition to a front panel console and debug port.

The unique SERDES design supports up to four different AMC port configurations for a mix of SRIO, PCIe, and SGMII channels. This makes the AMC extremely versatile and caters to a wider range of MicroTCA or ATCA Carrier topologies beyond just telecom applications. 4MB SPI Flash and 2 GB NAND Flash provide onboard options for software and storage. The AMC also provides 8 KHz and 19.44 MHz telecom clock synchronization support.

## **Main Carrier Board Specifications**

Dragonar avetem	CPU	Freescale QorIQ P5020 64bit e5500 PowerPC, up to 2.0	) GHz	
PTUCESSUL SYSTELLI	Bootloader	U-boot		
Poot Davias	SPI Flash	Spansion S25FL032P0XMFI011, 4 MB		
DUUL DEVICE	NAND Flash	SamSung K9WAG08U1D-SCB0000, 2 GB		
Momory	Technology	DDR III with ECC, up to 1333 MHz		
wemory	Max. Capacity	8 GB		
Ethornot	Controller	Netlogic AEL2005		
Ethernet	Interface	1GbE/10GbE capability for external access		
Hardware Monitor	Controller	IPMI v1.5 compatible MMC		
Firmworo	Source code	Pigeon Point System-based		
FIIIIWale	Update Standard	HPM.1 compliant		
Operation System	Compatibility	WindRiver Linux 4.2		
Operation System	Companying	Freescale DPAA SDK1.0 (Optional)		
	AMC	Mid-size, single width		
Form Factor	Interface	AMC.0 compliant and Configurable SERDES channel si - PCle: AMC.1 compliant with port 4-7, 8-11 - Ethernet: AMC.2 compliant with port 8-11 - SATA: AMC.3 compliant with port 2-3 - SRI0: AMC.4 compliant with port 4-7, 8-11	upport:	
Dower Consumption	Max	40 W		
Power Consumption	Typical	Less than 32 W		
Physical Characteristics	Dimensions (W x D)	180.6 x 73.5 mm		
		Operating	Storage	
	Temperature	-5 ~ 55° C	-40 ~ 70° C	
Environmont	Humidity	IEC60068-2-78 (95%RH @ 40° C)		
EIIVIIOIIIIIGIIL	Vibration	IEC60068-2-6 (0.002 G2/Hz, 1Grms)		
	Shock	IEC60068-2-27 (10 G, 11 ms)		
	Altitude	300 m below sea level to 4,000 m above sea level	10,000 above sea level	
Regulatory	Conformance	FCC Class B, CE, RoHS & WEEE (Plan)		
Compliance	Standards	PICMG AMC.0, AMC.1, AMC.2, AMC.3, AMC.4, IPMI	v1.5, HPM.1, NEBS Level 3 (Design compliant)	



## **Ordering Information**

Part Number	Description
AMC420211AE-ES	AMC-4202 with 2.0GHz P5020 and 4 GB DDR3-1333 MHz memory (PCIe as port 4-7, 4x SGMII as port 8-11)
AMC420213AE-ES	AMC-4202 with 2.0GHz P5020 and 4 GB DDR3-1333 MHz memory (SRIO as port 4-7, SRIO as port 8-11)

Contact our sales for more pricing & ordering information.

Note:

1.1 G or 10 G front panel is available on request.

2. 8 GB DDR3 is available on request.

## UTCA-5503

#### MicroTCA™ Carrier Hub: Layer 2 GbE switch with MCMC



#### **Features**

- Layer 2 GbE switch for up to 12 AdvancedMC  $^{\rm IM}$  modules on Common Options Fabric A
- MCH update channel for carrier hub redundancy
- Front panel GbE uplink over RJ-45 or SFP
- Pigeon point based MCMC with direct or switched 10/100 management LAN
- IPMB-0 / IPMB-L for complete carrier management
- Built-in expandability for future pluggable enhancements
- Switch management and extended fabric switching
- Customizable clock module and front panel I/O
- Compliant with PICMG MTCA.0 R1.0 specification

#### Introduction

The Advantech MicroTCA™ Carrier Hub UTCA-5503 combines into a single AdvancedMC Module that controls and manages infrastructure and the interconnect fabric resources necessary to support up to twelve AdvancedMCs in a MicroTCA shelf:

- A Primary Gigabit Ethernet fabric on Common Options Fabric A
- MicroTCA Carrier Management Controller (MCMC) functions to configure and control the elements

Where redundancy is required, two MCHs permit the creation of highly reliable systems.

#### Basic Interconnect Fabric, Control and Management Infrastructure

#### **MicroTCA Carrier Management Controller (MCMC)**

The first element on the MCH is the MicroTCA Carrier Management Controller (MCMC). It is the central authority in a MicroTCA Shelf and has the ability to monitor and control the constituent AdvancedMCs. This control function makes use of IPMI Links to each AdvancedMC, as well as presence detect, enable, and Geographic Address signals. When redundant MCHs are installed, failures in the management circuitry on one MCH can be handled by a failover to the other MCH. The MCMC LAN interface is available for optional remote management via the front panel RJ-45 connector or for optional routing to the Base Fabric switch.

#### **E-Keying**

Electronic keying (E-Keying) is the responsibility of the Carrier Manager and ensures that all AdvancedMCs and MCHs installed in a Shelf are compatible before they are permitted to power-up and enable their fabric links.

#### **Basic Interconnect Fabric**

In its basic configuration, the MCH acts as the Gigabit Ethernet hub of a star network, providing centralized switching and high-speed connectivity to each AdvancedMC. The Gigabit Ethernet Switch on the MCH provides an unmanaged layer 2, non-blocking, low-latency Gigabit Ethernet Switch.

Two MCHs can be used to implement a dual-star topology required for reliability. This is further enhanced by a Gigabit Ethernet Update Channel Port between the two MCHs. A front panel RJ-45 or SFP provides further network expandability with Gigabit Ethernet uplink ports for external interconnects.

This basic configuration provides a solid solution to the most cost sensitive application requirements.

## **Enhanced Options**

#### **Switch Management and Fat Pipe Fabrics**

The UTCA-5503 provides extension connectors between PCB1, 2 and 3 for clocks and enhanced processing functions such as Level 2/3 switch management, authentication and encryption; TPM facilities for server/cluster security; or HPI-over-IP remote management. It can also provide PCB3 switching for fat pipe PCI Express, SRIO, GbE or 10 GbE. A PCB2 module can be added for clock distribution and external clock connectivity. The front panel design offers flexibility for clock, I/O and alarm panel requirements.

#### **Clocks and Alarms**

An additional PCB2 module can be added to the MCH for enhanced clock distribution and external clock connectivity depending on customer specific requirements. Flexibility has been built into the Front PCB2 module design in order to meet a wide range of current and future Clock, I/O and Alarm panel requirements.

AD\ANTECH

#### UTCA-5503



## **Ordering Information**

Part Number	MCMC	LAN1 RJ-45	LAN2 RJ-45	LAN2 SFP	Fabric A GbE Switch	Comments
UTCA-5503-1000E	Yes	Yes	Yes	-	Yes	Management and Switch
UTCA-5503-2000E	Yes	Yes	-	Yes	Yes	Management and Switch

Note: Model with management only (no switch) will be available upon request. Please contact local sales representative for details.

## **Expansion Options**

Several options are currently under definition and planning for PCB 2 Clock modules, PCB 3 Processing and Switch management as well as Fat Pipe Fabric switching. Please contact your local sales representative for further details.

#### 3U CompactPCI® Intel® Atom™ Dual Core D525/N455 Processor Blade



#### **Features**

- Dual Core Intel<sup>®</sup> Atom<sup>™</sup> D525 processor/single core N455 processor
- Intel<sup>®</sup> I/O Controller Hub 8-Mobile (ICH8M)
- 2 GB DDR3 onboard up to 800 MT/s
- Optimized CompactFlash socket on single board computer
- 2.5" SATA-II HDD on XTM second layer
- Two 10/100/1000 Mbps ports, two USB ports,1 VGA port on front panel
- Two COM ports,1 USB ports,1 PS/2 port on 8HP second layer
- PICMG 2.0, R 3.0, PICMG 2.1, R 2.0 compliant



#### Introduction

Advantech's MIC-3325 is a 3U CompactPCI dual/single core processor blade based on the Intel<sup>®</sup> Atom<sup>™</sup> processor D525/N455+ICH8M two-chip platform. It provides the high performance of 2 cores and 4 threads of processing power at lower cost, and with easier validation. The MIC-3325 fully utilizes the I/O features of the Intel<sup>®</sup> Atom<sup>™</sup> processor makes operation in elevated temperature ranges possible. Breakthrough memory design puts 2GB SDRAM on board, while keeping the speed at DDR3 800MT/s. The on-board CPU and memory provide less weight and higher shock/vibration resistance than socket devices. With such benefits, the MIC-3325 can be used in mission-critical applications such as military defense, transportation, traffic control, test and measurement (T&M) as well as critical data acquisition & control applications. MIC-3325 uses the Intel<sup>®</sup> ICH8M as the PCH, which provides extensive I/O support. The Integrated Gigabit Ethernet Controller can operate at multiple speeds (10/100/1000 Mb/s) and in either full duplex or half duplex mode. A flexible 8HP extension module design provides the MIC-3325 with great flexibility and additional I/O connectivity to the customer. For more connectivity details, please contact an Advantech representative.

## **Specifications**

December Contern	CPU	Intel Atom N455 Single Core 1.66 GHz Intel Atom D525 Dual Core 1.8 GHz
	Max. Speed	1.8 GHz
Processor System	Chipset	Intel ICH8M @ Pine View-D Platform
	BIOS	SPI 2-MByte BIOS
	DMI	100 MHz reference clock
CompactPCI Interface	J1 Connector	32-bit PCI local bus (33MHz)
Compacti of internace	J2 Connector	RTM area
	Technology	DDR3-800 SDRAM
Memory	Max. Capacity	2 GB
	On board/socket	On board
	Chipset	Integrated in Intel Atom N455/D525
Graphics	Resolution	Intel Atom N455 Single Core up to 1400 x 1050 (SXGA) Intel Atom D525 Dual Core up to 2048 x 1536
	Controller	2Xi82583V
	Interface	10/100/1000 Mbps
Ethorpot	I/O Connector	RJ-45 x 1 (front panel), RJ-45 x 1 (RTM)
Ellieniel	Controller	ICH8M (MAC)+82567 (PHY)
	Interface	10/100/1000 Mbps
	I/O Connector	RJ-45 x 1 (front panel)
Storago	IDE	1 x CompactFlash Socket Type II
Sillaye	SATA	1 x Internal SATA connector only on 8HP version
	VGA	DB15 Port
	Ethernet	2 x 10/100/1000 Mbps RJ-45 connector
Front I/O	USB 2.0	2 x Type A ports
	LEDs	Power, Hot Swap
	8HP-option A	2 x DB9 RS-232, 1 x USB Type A port, 1 x PS/2 port

## Specifications (Cont.)

	SATA	1 SATA-II (internal)						
AllO (J2 interface)	VGA	1 port						
DIO (12 interface)	COM	2 ports (internal)						
NIO (J2 IIIteriace)	USB 2.0	2 ports						
	RJ-45	1 PCIex1 based on i82583V MAC/PHY						
Watchdog Timer	Supervision	0 ~ 255s, 1s step, generate reset signal						
Operating System	Compatibility	Microsoft Windows XP Professional, Windows 7, Win	dows XPE,Redhat6.1					
Power Requirement	Configuration	4HP, w/o RIO						
	Consumption	16.6 W for D525,14.6 W for N455 (4HP with peripherals)						
Physical Characteristics	Dimensions (W x D)	4HP, 160.00 x 100.00 mm (6.30" x 3.95") (PCB size)						
Physical Characteristics	Weight	Millions XI Transmission XI Transmission XI, Windows XI E, Fieddaler T       1     4HP, w/o RIO       1     16.6 W for D525,14.6 W for N455 (4HP with peripherals)       (W x D)     4HP, 160.00 x 100.00 mm (6.30" x 3.95") (PCB size)       0.4 kg including XTM       Operating       0.6 60° C (32, 140° E)						
		Operating	Non-operating					
	Temperature	0 ~ 60° C (32 ~ 140° F)	-40 ~ 85° C (-40 ~ 185° F)					
Environment	Humidity	5 to 95% @ 40°C (non condensing)	95% @ 60° C (non-condensing)					
Environment	Shock	10 G, 11ms	30 G, 11ms					
	Vibration	1.06 Grms (5 ~ 100 Hz, without on-board HDD)	2 Grms (5 ~ 500 Hz)					
Regulatory	Conformance	FCC, Class A, CE, RoHS						
Compliance	Standard	PICMG 2.0 Rev. 3.0 compatible; PICMG 2.1 R2.0 Com	pactPCI Hot Swap Specification					

## **Ordering Information**

Part Number	Description
MIC-3325D-S1E	MIC-3325 with D525 CPU 2G RAM single slot
MIC-3325D-D1E	MIC-3325 with D525 CPU 2G RAM dual slot
MIC-3325N-S1E	MIC-3325 with N455 CPU 2G RAM single slot
MIC-3325N-D1E	MIC-3325 with N455 CPU 2G RAM dual slot
MIC-3325XTM-S1E	3U CPCI Extension Board for MIC-3325

## **Optional Accessories**

Part Number	Description
MIC-3525-S1E	Rear I/O for MIC-3325 with VGA, LAN, USB, SATA, COM
MIC-3611/3-AE	4-port RS-232/422/485
MIC-3716/3-A	3U 250kS/s,16-bit,16-ch multifunction Card
MIC-3756/3-A	64-ch Isolated DI/O Card
MIC-3680/3-A	2-port CAN Card

## **MIC-3392L**

#### 6U CompactPCI Intel® Celeron® M Processor Blade



#### **Features**

- Supports Intel<sup>®</sup> Celeron<sup>®</sup> M 440 processor
- Intel<sup>®</sup> 945GME chipset supports 533/667 MHz FSB
- Up to 2 GB (DDR2 533/667) memory with SODIMM expansion
- Comprehensive I/O capability, dual Gigabit Ethernet, SATA, CompactFlash
- One 64-bit/66 MHz PMC expansion slot
- PICMG 2.16, R1.0 Packet Switching Backplane Specification compliant
- PICMG 2.9, R1.0 IPMI Specification compliant
- PICMG 2.1, R2.0 Hot-Swap Specification compliant
- Selectable System/Peripheral mode



### Introduction

The MIC-3392L is a full featured, but cost optimized CompactPCI CPU card ideally suited for cost sensitive control plane applications. It is built on Advantech's proven MIC-3392 Core design using Intel®'s 945 chipset for supporting high speed DDR2 onboard / pluggable memory, integrated graphics and standard I/Os such as onboard CompactFlash and 2.5" SATA HDDs. Dual GbE front ports and PICMG2.16 support give it the right connectivity for Computer Telephony, IPTV, Satellite and High Performance applications such as radar, imaging, instrumentation, communications, telephony and industrial control. Additional flexibility is achieved through the onboard PMC socket, which can host additional Ethernet ports using Advantech's MIC-3665 PMC or other I/Os based on third party PMCs. A choice of Advantech's rear transition modules complements the MIC-3392L to provide additional connectivity and I/O.

## **Specifications**

	CPU (Included)	Intel Celeron M 440 Processor, 1.86 GHz, 1 MB L2 cache
Processor System	Chipset	Intel 945GME/ICH7M
	BIOS	AMI 8 Mbit flash
Pue	Front Side Bus	533 MHz
DUS	PCI	Up to 64-bit/66 MHz
	Technology	DDR2 533/667 MHz
Momory	Max. Capacity	2 GB
IVIGITIOT Y	Sockat	SODIMM x 1
	SUCKEL	1 GB memory integrated on board
	Controller	Intel 945GME integrated
Graphics	VRAM	Dynamic
	Resolution	Up to 2048 x 1536, 64k color at 75 Hz
	Interface	10/100/1000 Mbps Ethernet
Ethernet	Controller	Intel 82573E x 2
	I/O Connector	RJ-45 x 2 (front)
Storage	Mode	SATA
	Channel	2
	Storage Site	One SATA connector and space reserved for embedded 2.5" HDD
Bridge	Bus	PCI 64-bit/66 MHz
Dilugo	Interface	Universal (system/peripheral mode capability)
I/O Interface	Serial (COM1)	RJ-45 x 1 (front)
Operating System	Compatibility	Windows XP/2000, Linux
Hardware Monitor	Controller	Winbond 83627DHG
	Monitor	CPU temperature, +3.3V, +5V, +12V
Watchdog Timer	Output	System reset
	Interval	Programmable, 0 ~ 255 sec.
	Site	1
PMC	Interface	IEEE1386.1 64-bit/66 MHz
	Signal	+5V/+3.3V compliant
	Solid State Disk	One CompactFlash socket
Miscellaneous	LEDs	HDD, Power, Hot Swap, system/peripheral, BMC Heartbeat
Wildoulanooud	USB 2.0	2 channels
	Real Time Clock	Built-in to South Bridge

## **Specifications (Cont.)**

Power Requirement	TDP	Max. 44 watts				
Dhysical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.19" x 6.3"), 1-slot width				
Physical characteristics	Weight	0.8 kg (1.76lb)				
		Operating (by screening service)	Non-operating			
Environment	Temperature	0 ~ 55° C (32 ~ 122° F)	-20 ~ 60° C (-4 ~ -140° F)			
	Humidity	-	95 %@ 60° C (non-condensing)			
	Shock	20 G	50 G			
	Vibration (5-500 Hz)	1.5 Grms	2.0G			
	Altitude	4,000m above sea level				
Pagulaton	Conformance	FCC Class A, CE, RoHS				
negulatory	Vibration (5-500 Hz)   1.5 Grms   2.0G     Altitude   4,000m above sea level   2.0G     Conformance   FCC Class A, CE, RoHS   2.0G     NEBS Level 3   Designed for GR-63-Core and GR-1089-Core   2.0G					
		PICMG 2.0, R3.0 CompactPCI Specification				
Compliance	Standards	PICMG 2.1, R2.0 Hot-Swap Specification				
oomphanoo		PICMG2.9, R1.0 IPMI Specification	adification			
		FIGIVIGE. TO, IT TO FACKEL SWITCHING BACKPIANE SPI	ecification			

## **Recommended Configurations**

MIC-3392LE MIC-3665-AE, MIC-3665-BE RIO-3310AE, RIO-3310S-A1E, RIO-3310S-A2E MIC-3042, MIC-3043	CPU Board	PMC Module	Rear I/O Board	Enclosure
	MIC-3392LE	MIC-3665-AE, MIC-3665-BE	RIO-3310AE, RIO-3310S-A1E, RIO-3310S-A2E	MIC-3042, MIC-3043

## **Ordering Information**

	Front Panel I/O					On-Board Option				
Part Number	LAN	СОМ	PMC	USB	VGA	CPU	Memory	CF socket	Storage Channel	Slot Width
MIC-3392LE	2	1	1	2	1	Celeron M 440	1 GB	1	1	1



# **MIC-3392Rev2** <sup>6U CompactPCI®</sup> Intel® Core™2 Duo Processor-based Board with Dual PCIe GbE/DDR2/SATA/PMC



### Introduction

The MIC-3392 is a high performance, power efficient CompactPCI single board computer based on the Intel<sup>®</sup> Core™2 Duo processor. It combines the benefits of two execution cores with Intel® intelligent power management features to deliver significantly greater performance per watt over previous Intel processors. The two execution cores share a poweroptimized 667 MHz front side bus to access the same system memory. To save power, address and data buffers are turned off when there is no activity. The MIC-3392 uses PCI Express (PCIe) technology to maximize I/O throughput. It supports up to 3 GB of 667 MHz DDR2 RAM (6.4 GB/s throughput), an onboard 2.5" Serial ATA HDD and a CompactFlash slot. Two front-accessible PCI Express (PCIe) Gigabit Ethernet (GbE) ports provide a bidirectional bandwidth of 2 Gb/s. In addition, the MIC-3392 supports Rear Transition Boards and PCI Mezzanine Cards for further expansion options.

## **Specifications**

	CPU (Not Included)	Intel Core 2 Duo T7400, Core Duo T2500, Celeron 530 or Celeron M 440 processor (Enclosure with forced air cooling is required)
Processor System	Max. Speed	2.16 GHz (up to 4 MB L2 cache)
,	Chipset	Intel 945GME
	BIOS	AMI 8 M-bit flash
Duo	Front Side Bus	533/667 MHz
DUS	PCI	Up to 64-bit/100 MHz
	Technology	DDR2 533/667 SDRAM
Momory	Max. Capacity	3 GB
Memory	Socket	SODIMM x 1 1 GB/ 2 GB memory integrated on board
	Controller	Intel 945GME integrated
Graphics	VRAM	Dynamic
	Resolution	Up to 2048 x 1536, 64k color at 75 Hz
Ethernet	Interface	10/100/1000 Mbps Ethernet
	Controller	Intel 82573E x 2
	I/O Connector	RJ-45 x 2 (front)
	Mode	SATA
Storage	Channels	1
	Storage Site	One SATA connector and space reserved for embedded 2.5" HDD
Bridge	Bus	PCI 64-bit/66 MHz
Diluyc	Interface	Universal (System/Peripheral mode capability)
I/O Interface	Serial (COM1)	RJ-45 x 1 (front)
Operating System	Compatibility	Windows Vista/XP/2000, Linux
Hardware Monitor	Controller	Winbond W83627DHG
	Monitor	CPU temperature, +3.3 V, +5 V, +12 V
Watchdog Timer	Output	System reset
	Interval	Programmable, 0 ~ 255 sec.
	Site	1 or 2
PMC	Interface	IEEE1386.1 64-bit/66 MHz on A version PMC1 and PMC2 are 64-bit/66 MHz on B version
	Signal	+5 V/+3.3 V compliant

## **Specifications (Cont.)**

	Solid State Disk	One CompactFlash socke	t				
Minoallanaoua	LEDs	HDD, Power, Hot Swap, s	ystem/peripheral				
Miscellaneous   Solid State Disk     LEDs   USB 2.0     Real Time Clock   Voltage     Power Requirement (Intel Core 2 Duo 2 GHz with 2 GB memory)   Voltage     Physical Characteristics   Dimensions (W x D)     Physical Characteristics   Temperature *     Environment   Humidity     Vibration   Altitude     Regulatory   Conformance     NEBS Level 3   Standard	USB 2.0	2 channels					
	Real Time Clock	Built-in to the South Brid	ge	+12 V -12 V 0.39 A 0 A 0.40 A 0 A -20 ~ 60° C (-4 ~ -140° F) 95% @ 60° C (non-condensing) 5 ~ 500 Hz, 3.5 Grms			
Power Requirement	Voltage	+3.3 V	+5 V	+12 V	-12 V		
(Intel Core 2 Duo 2 GHz	Typical	2.66 A	3.04 A	0.39 A	0 A		
with 2 GB memory)	Maximum	3.17 A	7.16 A	0.40 A	0 A		
Physical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.19"	x 6.3"), 1-slot width				
Physical Characteristics	Dimensions (W x D)     233.35 x 160 mm (9.19" x 6.3"), 1-slot width       Weight     0.8 kg (1.76 lb)       Operating     Operating       Temperature *     0 ~ 60° C (32 ~ 140° F)       Humidity     -						
Physical Characteristics Environment		Operating		Non-Operating			
	Temperature *	0 ~ 60° C (32 ~ 140° F)		-20 ~ 60° C (-4 ~ -140° F	.)		
	Humidity	-		95% @ 60° C (non-condensing)			
	Vibration	5 ~ 500 Hz 1.5 Grms (wit	hout on-bard HDD)	5 ~ 500 Hz, 3.5 Grms			
	Real Time Clock   Built-in to the South Bridge     ement   Voltage   +3.3 V   +5 V   +12 V     Duo 2 GHz   Typical   2.66 A   3.04 A   0.39 A     mory)   Maximum   3.17 A   7.16 A   0.40 A     racteristics   Dimensions (W x D)   233.35 x 160 mm (9.19" x 6.3"), 1-slot width     weight   0.8 kg (1.76 lb)   Non-Operating     Temperature *   0 ~ 60° C (32 ~ 140° F)   -20 ~ 60° C (-4     Humidity   -   95% @ 60° C     Vibration   5 ~ 500 Hz 1.5 Grms (without on-bard HDD)   5 ~ 500 Hz, 3.5     Altitude   4000 m above sea level   5 ~ 500 Hz, 3.5     NEBS Level 3   Design for GR-63-Core & GR-1089-Core   PICMG 2.0, R3.0 CompactPCI Specification     PICMG 2.1, R2.0 Hot-Swap Specification   PICMG 2.1, R2.0 Hot-Swap Specification   PICMG 2.1, R2.0 Hot-Swap Specification						
Degulatory	Conformance	FCC Class A, CE					
negulatory	Voltage     +3.3 V     +5 V     +12 V       SHz     Typical     2.66 A     3.04 A     0.39 A       Maximum     3.17 A     7.16 A     0.40 A       tics     Dimensions (W x D)     233.35 x 160 mm (9.19" x 6.3"), 1-slot width       Weight     0.8 kg (1.76 lb)     Non-Operating       Temperature *     0 ~ 60° C (32 ~ 140° F)     -20 ~ 60° C (-4 ~       Humidity     -     95% @ 60° C (n       Vibration     5 ~ 500 Hz 1.5 Grms (without on-bard HDD)     5 ~ 500 Hz, 3.5 C       Altitude     4000 m above sea level     -       Conformance     FCC Class A, CE     -       NEBS Level 3     Design for GR-63-Core & GR-1089-Core     -       PICMG 2.0, R3.0 CompactPCI Specification     -     PICMG 2.1, R2.0 Hot-Swap Specification						
		PICMG 2.0, R3.0 CompactPCI Specification					
Compliance	Standard	PICMG 2.1, R2.0 Hot-Sw	ap Specification				
Compliance	Statiuaru	PICMG 2.9, R1.0 IPMI S	pecification				
		PICMG 2.16, R1.0 Packe	t Switching Backplane Specif	ication			

\*Note: Optional large heatsink available but only adapted to single PMC model. Please contact your local distributor for ordering information.

## **Recommended Configurations**

CPU Board	PMC Module	Rear I/O Board	Enclosure
MIC-3392A2-MxE, MIC-3392B2-MxE	MIC-3665-AE, MIC-3665-BE	RIO-3310AE, RIO-3310S-A1E, RIO-3310S-A2E	MIC-3042, MIC-3043

## **Rear Transition Board**

		Rear Panel								Onboard Header/Socket/Connector					
Part	KB & Mouse	COM2 *	GbE LAN	VGA	USB	10/100 Mbps LAN	SCSI **	IDE	SATA	FDD	SCSI**	PRT	USB	Slot Width	Conn.
RIO-3310S-A1E	1	1	2	1	1	1	-	1	1	1	1	1	1	1	J3/J5
RIO-3310S-A2E	1	1	2	1	1	1	1	1	1	1	1	1	1	1	J3/J5
RIO-3310AE	1	1	2	1	1	1	-	1	1	1	-	1	1	1	J3/J5

\*Note: Optional 3rd LAN port occupies the rear COM2 port

\*\*Note: Internal Ultra 320 SCSI port with optional external rear I/O port

### **Ordering Information**

	Front Panel I/O					Main Onboard Features					
Model Number	LAN	СОМ	PMC	USB	VGA	CPU	Memory	CF Socket	Storage Channel	Slot Width	
MIC-3392A2-M1E	2	1	1	2	1	-	1 GB	1	1	1	
MIC-3392A2-M2E	2	1	1	2	1	-	2 GB	1	1	1	
MIC-3392B2-M1E	1	1	2	-	-	-	1 GB	1	1	1	
MIC-3392B2-M2E	1	1	2	-	-	-	2 GB	1	1	1	





Note: These pictures are based on the "MIC-3392B2-M1E" model.

# **MIC-3392MIL**

#### 6U CompactPCI® Intel® Core™2 Duo Rugged Processor Blade



#### **Features**

- Supports Intel<sup>®</sup> Core<sup>™</sup> Duo Low Voltage or Core<sup>™</sup>2 Duo Ultra Low Voltage mobile processor
- Intel<sup>®</sup> 945GME chipset supports 533/667 MHz FSB
- Up to 3 GB (DDR2 533/667) memory with SODIMM expansion
- Conduction cooled with ANSI/VITA30.1-2002 compliancy
- Pre-heat circuitry for reliable cold-booting in low temperature environment, or optional support for IPMI v1.5 without pre-heat
- Boot from network, Compact Flash, or local 2.5" SATA HDD
- Four GbE ports, two USB 2.0 ports, two DVI-I ports, one P/S2 port, and one COM interface to the Rear Transition Module
- Optional one VGA port and two USB 2.0 ports to front panel
- Optional conformal coating and SODIMM gluing service
- PICMG 2.16 R1.0, PICMG 2.1 R2.0, PICMG 2.6 R1.0 compliant



### Introduction

MIC-3392MIL, a CompactPCI PICMG 2.16 compliant single slot 6 U CPU board, comes with three different configurations that meet a wide range of environmental requirements for ruggedized applications. Based on the Intel<sup>®</sup> Core<sup>M</sup> Duo LV or Core 2 Duo ULV processor, it offers a low power dissipation design without the need of on-board forced ventilation. Ruggedized requirements are addressed by a conduction cooled design and extended operating temperature range (-40° C ~ 70° C). Shock and vibration resistances of the board are increased by using wedge locks and a single-piece CNC-milled aluminum alloy plate that conforms to the major IC packages. With highly integrated functional capabilities, the MIC-3392MIL fully utilizes the I/O features of the Intel chipsets. It supports up to 3 GB of 667 MHz DDR2 RAM, an onboard 2.5" Serial ATA HDD, a CompactFlash slot, and a set of I/O functions brought through the backplane to a unique rear transition module, which contains four LAN ports, two DVI-I ports, two USB 2.0 ports, one P/S2 port, and one RS-232 port on the panel.

## **Specifications**

	CPU	Intel Core 2 Duo ULV or Core Duo LV up to 1.6 GHz (2 MB L2 cache)
Processor System	Chipset	Intel 945GME/ICH7M
	BIOS	Award 4Mb flash
	J1 Connector	32-bit PCI local bus
CompactPCI Interface	J2 Connector	64-bit PCI local bus
	J3~J5 Connectors	PICMG2.16 + RTM area
PCL X to cPCI Bridge	Controller	PLX PCI 6540CB
F GI-A LU GF GI DI luye	Interface	Master/Drone
Ruc	Front Side Bus	533/667 MHz
Dus	PCI	Up to 64-bit/66 MHz
	Technology	DDR2 533/667 MHz
Memory	Max. Capacity	3 GB
womony	Socket	SODIMM x1
	JUCKGI	2 GB memory integrated on board
	Controller	Intel 945GME integrated
Graphics	VRAM	Dynamic
	Resolution	Up to 2048 x 1536, 64k color at 75 Hz
	Controller	Intel 82571EB dual-port Gigabit Ethernet controller
	Interface	10/100/1000 Mbps Ethernet (on PCIe x4 channel)
Ethornot	I/O Connector	PICMG2.16 and RJ-45 x2 (RTM rear panel)
Linomot	Controller	Intel 82546GB dual-port Gigabit Ethernet controller
	Interface	10/100/1000 Mbps Ethernet (on PCI 32bits/33Mhz)
	I/O Connector	RJ-45 x 2 (RTM rear panel)
	Mode	SATA
	Channel	2 interfaces to CompactPCI connector
Storage	Storage Site	1 SATA connector and space reserved for a 2.5" HDD on one of the two channels (optional for non-conduction cooled product configuration)
	Mode	IDE
	Channel	1 interface to CompactPCI connector
	Storage Site	1 on-board CompactFlash socket on the same channel

## **Specifications (Cont.)**

	USB 2.0	2 host ports (std. USB connectors) on front panel and 4 h	ost interfaces to cPCI connectors						
Europaion 1/0	DVI-I	2 interfaces to CompactPCI connector							
Expansion i/O	Serial	3 interfaces to CompactPCI connector (1 reserved for BMC IPMI F/W update)							
	Parallel, FDD, PS2	Each with 1 interface to CompactPCI connector	Each with 1 interface to CompactPCI connector						
Watehdea Timer	Output	Local Rest and Interrupt							
watchuog miner	Interval	Programmable 1s ~ 255s							
Hardware Monitor	Controller	Winbond 83627HG							
BMC	Controller	Renesas H8S 2167, IPMIv1.5 compliant for standard Con	npactPCI SKU/Pre-heat F/W for conduction-cool SKU,						
DIVIO	Controllor	mutually exclusive							
Operating System	Compatibility	Windows XP/2000, Linux, VxWorks 6.4 (on request)							
Miscellaneous	Front Panel LEDs	x1 blue/vellow for Hot Swap/HDD, x1 green for Master/D	rone, x1 vellow BMC Heartbeat, and x1 green for Power						
	(standard cPCI SKU only)								
Power Requirement	Configuration	Conduction cooled SKU (with Intel U/500 processor)							
	TDP	37 watts (thermal model available on request)							
Physical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.19" x 6.3")							
		Operating	Non-operating						
	Temperature	0 ~ 70° C (std CompactPCI SKU) -40 ~ 70° C (conduction-cool with pre-heat)	-50 ~ 80° C						
Environment	Humidity	5 ~ 85 % @ 45° C, non-condensing	10 ~ 95 % @ 45° C, non-condensing						
EIIVIIOIIIIIEIIL	Vibration (5-500 Hz)	1.5 Grms (without on-board 2.5" SATA HDD)	2 G						
	Shock	20G (without on-board 2.5" SATA HDD)	50 G						
	Altitude	300m below sea level to 4,000m above sea level	10 000m above sea level						
	, intrado	(without conformal coating)							
Regulatory	Conformance	FCC Class A, CE, RoHS							
nogulatory	NEBS Level 3	Designed for GR-63-Core and GR-1089-Core							
Compliance	Standards	PICMG 2.0 R3.0, PICMG 2.1 R.0, PICMG 2.9 R1.0 (std c	PCI SKU), PICMG 2.16 R1.0, ANSI/VITA 30.1-2002						

## **Recommended Configurations**

CPU Board	Rear I/O Board	Enclosure
MIC-3392MILS-PxE Series	RIO-3392MIL-AxE Series	MIC-3039-BE, MIC-3042A/B, MIC-3043A/B/C/D, MIC-3056A, MIC-3081B
MIC-3392MILC-P1E	RIO-3392MIL-AxE Series	Customized conduction cool enclosure

## **Ordering Information**

		Fro	ont Panel		Conduction		Conformal				
System Board	VGA	USB2.0	BMC Reset	System Reset	Cool	CPU	Memory	CF Socket	Storage Channel	SODIMM Socket	Coating
MIC-3392MILS-P1E	1	2	Yes	Yes	-	Intel U7500	2 GB	1	1	1	-
MIC-3392MILS-P2E	1	2	Yes	Yes	-	Intel L2400	2 GB	1	1	1	-
MIC-3392MILC-P1E	-	-	-	-	Yes	Intel U7500	2 GB	1	-	-	Yes

Rear Panel					On-board Header/Socket/Connector							Conformal		
RTM Model	LAN	СОМ	DVI-I	PS2	USB	IDE	FDD	LPT	SATA	COM Interface	Console Interface	USB Interface	Conn.	Coating
RIO-3392MIL-A1E	4	1	2	1	2	1	1	1	2	1	1	2	J3 ~ J5	-
RIO-3392MIL-A2E	4	1	2	1	2	1	1	1	2	1	1	2	J3 ~ J5	Yes





MIC-3392MILS-PxE Series

MIC-3392MILC-P1E

#### 6U CompactPCI<sup>®</sup> 2nd and 3rd Generation Intel Core i3/i5/i7 Processor Blade with ECC Support



#### **Features**

- Support 2nd and 3rd Generation Intel<sup>®</sup> Core™ i3/i5/i7 Processors and Intel QM67 PCH with embedded graphics (dual independent display)
- Up to 16 GB (DDR3 1066/1333/1600) ECC memory (max 8GB on-board socket SO-UDIMM x1, max 8GB)
- Optimized single-slot SBC with 2.5" SATA-III HDD/CFast socket
- Integrate on-board 2KB NVRAM and min. 8GB flash (optional)
- TPM
- Two SATA ports, four USB 2.0 ports, two DVI ports, two RS-232 ports, one PS/2 connector, and PCIe x4 interfaces to the Rear Transition Module (RTM)
- Six gigabit Ethernet ports for PICMG 2.16, front and rear connectivity
- PICMG 2.16 R1.0, PICMG 2.1 R2.0, PICMG 2.6 R1.0 compliant



#### Introduction

Using Intel<sup>®</sup>'s 2nd and 3rd generation Core™ i3/i5/i7 processors based on 32nm and 22nm process technology supporting up to two Cores / four threads at 2.2 GHz and 4 MB level 2 cache, the MIC-3395 blade boosts computing performance deploying the latest virtualization, techniques and CPU enhancements. Onboard soldered DRAM with ECC support and optional memory expansion via an SODIMM socket extend the memory to a maximum of 16 GB to support the most demanding applications in high performance or virtualized environments, supporting up to 4GB per virtual machine. Dual channel design and memory speeds up to 1333MT/s for 2nd generation or 1600MT/s for 3rd generation processors along with increased cache size and cache algorithms guarantee maximum memory throughput. Combined with the powerful Intel QM67 chipset, these new processors offer improved I/O performance by leveraging 5GT/s DMI and PCIe interfaces. An onboard XMC/PMC site with PCIe x8 gen.2 connectivity can host high speed offload or I/O mezzanines such as the MIC-3666 dual 10GE XMC card. With SATA-III support and up to 6Gbps I/O, the latest enhancements in storage technology such as high speed SSDs can be employed. Six gigabit Ethernet ports for PICMG 2.16, front and rear connectivity ensure best in class network connectivity. The processor's integrated enhanced graphics engine (HD3000/HD4000) offers twice the performance over previous generations. With dual independent display support, the MIC-3395 is an ideal fit for demanding workstation or imaging applications. RASUM features integrated in the CPU and chipset combined with PICMG 2.9, IPMI-based management make the MIC-3395 a highly available and reliable computing engine. The RIO-3315 RTM module supports one PS/2 connector with both keyboard and mouse ports, two USB ports, two RS-232 ports, two SATA ports, two DVI ports, and two Gigabit Ethernet ports. In case the SATA disk drives and SATA RAID support of the QM67 do not meet performance and reliability requirements, the RIO-3315 SAS version supports a

## **Specifications**

	CPU	Intel 2nd and 3rd Generation Core i3/i5/i7 up to 2.2 GHz (4MB L2 cache)
Processor System	Platform Controller Hub	Hub Intel QM67
-	BIOS	Redundant AMI 8MByte SPI flash
	J1 Connector	32-bit PCI local bus
CompactPCLInterface	J2 Connector	64-bit PCI local bus
Compactr of Interface	J3 Connector	PICMG2.16 + RTM area
	J4~J5 Connectors	RTM area
YMC/PMC Sockat	PCIe x8	Gen2 (5GT/s)
	PCI	64-bit/66 MHz
	Technology	DDR3 1066/1333/1600 MHz, dual channel with ECC support
Memory	Max. Capacity	Up to 16 GB (8 GB on-board, 8 GB SODIMM)
	Socket	204-pin SOUDIMM x1
	Controller	Intel embedded graphic controller HD3000/HD4000 (dual independent display)
Graphics	VRAM	Dynamic
	Resolution	Up to 2048 x 1536, 64k colors at 75Hz
	Controller	5 Intel 82574L single-port Gigabit Ethernet controllers (on PCIe x1 channel),
	Controllor	1 Intel 82579LM single-port Gigabit Ethernet controller
	Interface	10/100/1000 Mbps Ethernet
Ethernet	I/O Connector	PICMG 2.16 and RJ-45 x2 (RTM rear panel), RJ-45 x1 (front panel)
	Controller	1 Intel 82579LM single-port Gigabit Ethernet controller
	Interface	10/100/1000 Mbps Ethernet
	I/O Connector	RJ-45 (front panel)
	Mode	SATA-III
	Channels	Onboard SATA-III connector
Storage	Mode	SATA-II
otolugo		2 channels to RTM
	Channels	1 channel to CFast socket
		1 channel to on-board flash (optional)

## **Specifications (Cont.)**

	USB2.0	2 type A						
	COM	1 RS232 on RJ45						
French 1/O	LAN	2 10/100/1000 Mbps on RJ45						
Front I/U	Front Panel LEDs	x1 blue/yellow for Hot Swap/HDD, x1 green for Master/Drone mode, x1 yellow BMC Heartbeat, and x1 green for Power						
	Buttons	CPU reset button and BMC reset button						
	USB2.0	4 ports						
	COM	2 ports						
Poor I/O	LAN	2 ports						
near 1/0	SATA	2 SATA-II						
	PCIe	1 PCle x4						
	Others	PS/2 for keyboard & mouse, DVI-I and DVI-D						
Watchdog Timor	Output	Local Rest and Interrupt						
Watchuog Timer	Interval	Programmable 1s ~ 255s						
Hardware Monitor	HWM	NCT6776F						
BMC	Controller	Renesas H8S 2167, IPMI v2.0 compliant						
Operating System	Compatibility	Windows 7, Windows 2008, Windows 2003, Windows XI	P SP3, RHEL 6.1, VxWorks 6.x (on request)					
Miscellaneous	NVRAM	2KB						
Power Poquirement	Configuration	4HP						
r ower nequilement	TDP	Maximum: up to 60 W (quad core), 50 W (dual core) or le	ess, depending on CPU type					
Physical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.19" x 6.3")						
		Operating	Non-operating					
	Temperature	0 ~ 55° C (32 ~ 122° F)	-40 ~ 85° C (-40 ~ 185° F)					
Environment	Humidity	95 % @ 40° C, non-condensing	95 % @ 60° C, non-condensing					
EITVITOTITTIETTE	Vibration (5-500 Hz)	2 Grms (without on-board 2.5" SATA HDD)	3.5 Grms					
	Shock	20 G (without on-board 2.5" SATA HDD)	50 G					
	Altitude	4,000 m above sea level	10,000 m above sea level					
Pogulatory	Conformance	FCC Class A, CE, RoHS						
negulatory	NEBS Level 3	Designed to meet GR-63-Core and GR-1089-Core						
Compliance	Standards	PICMG2.0 R3.0, PICMG2.1 R.0, PICMG2.9 R1.0, PICMG	2.16 R1.0,					

## **Ordering Information**

		Front	Panel		Main On-board Features						
Part Number	VGA	USB2.0 (type A)	Ethernet (RJ45)	Console (RJ45)	CPU	Onboard Memory	CFast Socket	Storage Channel	SODIMM Socket	BMC Function	
MIC-3395A1-M4E	1	2	2	1	i7-2655LE	4 GB	1	1 SATA-III	1	No	
MIC-3395A2-M4E	1	2	2	1	i7-2655LE	4 GB	1	1 SATA-III	1	Yes	
MIC-3395B1-M4E*	1	2	2	1	i5-2515E	4 GB	1	1 SATA-III	1	Yes	
MIC-3395C1-M4E*	1	2	2	1	i7-2715QE	4 GB	1	1 SATA-III	1	Yes	

\*Note: MIC-3395B1-M4E and MIC-3395C1-M4E available by request; please contact your local sales office.

## **Related Products**

Part Number	Description
RIO-3315-A1E	RTM Module with SAS Controller for MIC-3395
RIO-3315-B1E	RTM Module without SAS Controller for MIC-3395
RIO-3315-C1E	RTM Module with 4 LAN ports for MIC-3395
MIC-3666-AE	Dual 10 Gigabit Ethernet XMC
MIC-3665-AE	CompactPCI PMC with dual copper (RJ-45) Gigabit Ethernet interfaces
MIC-3665-BE	CompactPCI PMC with dual fiber Gigabit Ethernet

#### MIC-3395x-MxE Series



#### 6U CompactPCI® Intel® Xeon® Processor Quad/Dual Core Blade



#### **Features**

- Supports 45 nm Intel<sup>®</sup> Xeon<sup>®</sup> Low Voltage/Ultra Low Voltage processor
- Intel<sup>®</sup> 5100MCH chipset supports 1066/1333 MHz FSB
- Up to 6 GB (DDR2 533/667) ECC memory
- Optimized design in one or two slots SBC with 2.5" SATA HDD/CompactFlash socket
- Optional Extension Module on 8HP version supports two XMCs/PMCs, two 2.5" SATA HDDs or VGA display output
- TPM, three GbE ports, six SATA ports, four USB 2.0 ports, one VGA port, three RS-232 ports, one PS/2 connector, and PCIe x1, PCIe x4 interfaces to the Rear Transition Module (RTM)
- Built-in Intel<sup>®</sup> I/OAT technology for enhanced I/O performance
- PICMG 2.16 R1.0, PICMG 2.9 R1.0, PICMG 2.1 R2.0 compliant



#### Introduction

Experience true server class performance on CompactPCI. Using Intel<sup>®</sup> 45nm 64-bit Xeon technology with up to four Cores at 2.33 GHz combined with the powerful Intel<sup>®</sup> 5100MCH/ ICH9R chipset, the MIC-3393 blade boosts computing and I/O performance deploying the latest virtualization, multi-threading and I/OAT acceleration techniques. Enhanced Xeon<sup>®</sup> packaging, front side bus parity, onboard, soldered DRAM with ECC support and RASUM features integrated in the 5100 MCH combined with PICMG2.9, IPMI-based management make the MIC-3393 a highly available and reliable high performance computing engine. The comprehensive I/O subsystem includes a 2.5" SATA HDD or CompactFlash slot, three advanced Gigabit Ethernet controllers, two UARTs, USB ports and a TPM. The addition of PCIe links to the RTM further enhances versatility compared to previous generation blades resulting in best-in-class connectivity.

The RIO-3311 RTM module supports one PS/2 connector with both keyboard and mouse ports, three USB ports, two RS-232 ports, 2 SATA ports, a PCIe based server graphics controller with VGA port, a USB port for USB NAND flash module, and alternate cabling for the three Gigabit Ethernet ports of the MIC-3393. In case the SATA disk drives and SATA RAID support of the ICH9R do not meet performance and reliability requirements, the RIO-3311 SAS version supports a 4-port SAS controller with RAID and failover support.

The MIC-3393 is outfitted with single slot (4HP) or dual slot (8HP) front panels to match CPU performance, CPU power dissipation, and system cooling capabilities. The 8HP version of the blade can be extended with a MIC-3312 mezzanine module which can carry two XMCs/PMCs or two 2.5" SATA HDDs to support enhanced I/O modularity and additional mass storage options; or extended with a MIC-3313 mezzanine module which support one VGA display output. If further combine with rear I/O board RIO-3313, the CPCI system can support dual display.

## **Specifications**

	CPU	Quad-Core/Dual-Core Intel Xeon processor LV or Dual-Core Intel Xeon processor ULV up to 2.66 GHz
Drasses Custom	Chipset	Intel 5100MCH/ICH9R
Processor System	Front Side Bus	1066/1333 MHz with parity protection
	BIOS	Redundant AMI 2MByte SPI flash
	Technology	Dual channel DDR2 533/667 MHz with ECC
Memory	Max. Capacity	2 GB onboard, max. 6 GB total
	Socket	SODIMM x2
	J1~J2 Connectors	64-bit/66 MHz PCI local bus + RTM
	J3 Connector	PICMG2.16 + RTM
CompactPCI Interface	J5 Connector	RTM
	Bridge	Pericom PI7C9X130DNDE + PLX PCI 6540CB
	Mode	System Master/Drone (Standalone)
	Controller	2 Intel 82574L single-port Gigabit Ethernet controllers
	Interface	10/100/1000 Mbps Ethernet
Ethornot	I/O Connector	PICMG2.16 x 1, RJ-45 x1 or RTM x 2
Ethemet	Controller	Intel ICH9R MAC and Intel 82566DM Gigabit Ethernet PHY
	Interface	10/100/1000 Mbps Ethernet
	I/O Connector	RJ-45 x 1 or RTM x 1
Creekies (on DTM)	Controller	XGI Volari Z11 PCIe Server graphics with 32 MB VRAM
Graphics (OFFRINI)	Resolution	Up to 1600 x 1200, 64k hi-color at 70Hz
	Туре	SATA-II
Storage		1 channel. onboard SATA HDD carrier (default) or CF disk carrier (option)*
Storage	Channels	2 channels. to RTM
		2 channels to extension module (8HP only)
	USB 2.0	2 type A
	COM	1 RS-232 on RJ-45
Front I/O	LAN	2 10/100/1000 Mbps on RJ-45
	Front Panel LEDs	x 1 blue/yellow for Hot Swap/HDD, x 1 green for Master/Drone, x 1 yellow BMC Heartbeat, and x 1 green for Power
	Buttons	CPU and BMC reset buttons

\*Note: CF disk carrier is available upon request

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## **Specifications (Cont.)**

	USB	4 ports					
	COM	2 ports					
D 1/0	LAN	3 10/1000/1000 Mbps					
Rear I/U	SATA	2 ports					
	PCle	1 PCle x 1, 1 PCle x 4					
	Others	PS/2 for keyboard & mouse					
	CMOS	Battery backed up with backup copy in EEPROM					
DIOC	Boot Options	SATA, SAS, USB ports, USB flash disk, network (PXE)					
BIUS	Console	VGA or console redirection over COM Port, SoL supported by E	BMC				
	Other	Supports operation without disk, keyboard, video					
Watabdag Timor	Output	Local Reset and Interrupt					
watchuog timer	Interval	Programmable 1s ~ 255s					
Hardware Monitor	Controller	Winbond 83627DHG: voltages, CPU, chipset, board temperatur	e				
BMC	Controller	Renesas H8S 2167, IPMIv2.0 compliant					
Operating System	Compatibility	Windows XP 32/64 bit, Windows Server 2008 32/64 bit, Windows Server 2003 32/64 bit, Linux					
Power Pequirement	Configuration	4HP	8HP				
	TDP (max./typ.)	60W / <50W	90W / <75W				
Physical Characteristics	Dimensions & Weight	6U /1 slot width (4HP), 233.35 x 160 x 20 mm (9.2" x 6.3" x 0.4 6U /2 slots width (8HP), 233.35 x 160 x 40 mm (9.2" x 6.3" x 1	8"), 1.03 kg (2.27 lb) .6"), 1.42 kg (3.14 lb)				
		Operating	Non-operating				
	Temperature	0 ~ 55° C (32 ~ 122° F)	-40 ~ 85° C (-40 ~ 185° F)				
	Humidity	95 %@ 40° C, non-condensing	95 %@ 60° C, non-condensing				
Environment	Vibration	5 ~ 500Hz, 2Grms (4HP), 1Grms (8HP) (without on-board 2.5" SATA HDD)	5 ~ 500Hz, 3.5Grms				
	Bump	-	15G, 6ms (without on-board 2.5" SATA HDD)				
	Altitude	4,000m above sea level					
Regulatory	Conformance	FCC Class A, CE, RoHS					
negulatol y	NEBS Level 3	Designed for GR-63-Core and GR-1089-Core					
Compliance	Standards	PICMG2.0 R3.0, PICMG2.1 R2.0, PICMG2.9 R1.0, PICMG2.16	R1.0				

## **Supported CPU Configurations**

Intel CPU Model Number	CPU architecture	# Cores	Freq.	Cache	FSB	CPU TDP	Required airflow for single slot width	Required airflow for dual slot width
L5410	45 nm	4	2.33 GHz	12 MB	1333 MHz	50W	60CFM	35CFM
L5408	45 nm	4	2.13 GHz	12 MB	1066 MHz	40W	50CFM	30CFM
L5238	45 nm	2	2.66 GHz	6 MB	1333 MHz	35W	40CFM	25CFM
L5215	45 nm	2	1.86 GHz	6 MB	1066 MHz	20W	20CFM	15CFM
L3014	45 nm	1	2.4 GHz	3 MB	1066 MHz	30W	50CFM*	30CFM

\*Note: These CPUs support extended case temperature and are qualified for NEBS environments \*\*Note: Strong airflow required for the L3014 CPU is restricted to its thermal specification (Tc 60° C)

## **Recommended Configurations**

CPU Board	Extension Module	Rear I/O Board
MIC-3393A-M2E	-	RIO-3311-A1E or RIO-3311-A2E
MIC-3393B-M2E	MIC-3312-A1E	RIO-3311-A1E or RIO-3311-A2E
MIC-3393C-M2E	MIC-3312-A2E	RIO-3311-A1E or RIO-3311-A2E
MIC-3393D-M2E	MIC-3313-A1E	RIO-3311-A1E, RIO-3311-A2E or RIO-3313-A1E*

\*Note: RIO-3313-A1E must be used with MIC-3313-A1E

### **Ordering Information**

Sustam Board	Front Panel						Extension Module			
System board	LAN	COM	USB	XMC/PMC Knockout	VGA Knockout	Memory	SATA HDD Socket	<b>CF Socket</b>	Slot Width	Extension mounte
MIC-3393A-M2E	2	1	2	-	-	2 GB	1	1	1	-
MIC-3393B-M2E	2	1	2	2	-	2 GB	1	1	2	MIC-3312-A1E
MIC-3393C-M2E	2	1	2	-	-	2 GB	1	1	2	MIC-3312-A2E
MIC-3393D-M2E	2	1	2	-	1	2 GB	1	1	2	MIC-3313-A1E

\*Note: Use of single rank, dual die package stack (3.8 mm) SORDIMM is advised \*\*Note: CF board is included as accessory

DTM Model	Rear Panel					On-board Header/Socket/Connector							
	LAN	COM	VGA	DVI-D	PS/2*	USB	MiniSAS	USB	USB Flash**	SATA	SAS (SATA interface)	Slot Width	Conn.
RIO-3311-A1E	3	2	1	-	1*	2	1	1	-	2	4	1	J1,J3,J5
RIO-3311-A2E	3	2	1	-	1*	2	-	1	1	2	-	1	J1,J3,J5
RIO-3313-A1E	-	-	1	2	-	-	-	-	-	1	-	-	J5

\*Note: One PS/2 port carries the signals for both K/B and mouse. Y cable is included. \*\*Note: Use of Advantech EmbCore USB 2.0 Disk Module (Type C) recommended



## **Ordering Information (Cont.)**

VTM Model	On-board Header/Socket/Connector				
	XMC/PMC	SATA HDD	VGA		
MIC-3312-A1E	2	-	-		
MIC-3312-A2E	-	2	-		
MIC-3313-A1E	-	-	1		



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#### **Dual 10 Gigabit Ethernet XMC**

RoHS



#### **Features**

- Intel® 82599 Dual Port 10 Gigabit Ethernet Controller
- PCIe x8 Gen.2 host interface
- Dual SFP+ connectors
- Compliant with VITA 42.0-2005, 42.3-2006 XMC specifications

#### Introduction

The MIC-3666 is a low power, dual-port 10 GbE XMC, with SFP+ pluggable modules for multi-mode and single-mode fiber media and is based on the Intel<sup>®</sup> 82599ES 10 Gigabit Ethernet controller. The XMC provides a high performance PCIe x8 interface at 5 Gb/s per lane at an outstanding low power dissipation of less than 10W. Support for Intel<sup>®</sup>'s offloading and platform enhancement features yields maximum network throughput while preserving valuable CPU cycles for application processing.

The MIC-3666 features an Intel® 82599 which provides Intel® Virtualization Technology for Connectivity (VT-c) including Virtual Machine Device Queues (VMDq) and PCI\_SIG compliant Single Root I/O Virtualization (SR-IOV), helping to reduce I/O bottlenecks, boost throughput, and reduce latency. Where virtualization is required, VMDqs improve performance by offloading the data-sorting burden from the virtual machine manager (VMM) to the network controller. The MIC-3666's specialized features include Layer 2 & 3 security with IPSec & LinkSec; Intel I/OAT Acceleration Technology v3.0; VLAN tagging, stripping and packet filtering; and TCP, iSCSI, and Fiber Channel over Ethernet (FCoE) offload.

#### **Specifications**

VMC Connectivity	Connector	P15 assembled,			
AIVIG CONNECTIVITY	Host interface	PCIe x8 gen.2 @ 5Gbps/lane			
	Controller	Intel 82599ES dual 10GbE MAC/PHY			
	Virtualization Technologies	VMDq, VMD, SR-IOV			
	IP	IPv4, IPv6			
Controller	Queues	128RX, 128TX per port			
	Offloading	TCP, UDP, SCTP, FCoE			
	Socurity Accoloration	Linksec IEEE802.1ae (AES-128 Authorization./Encrypt	ion)		
	Security Acceleration	IPSec (AES-128, 1024 SA's)			
1/0	SFP+	2 sites with support for presence detect, status and ID	EEPROM		
1/0	LEDs	Network Link, Activity			
	Linux	X86 Kernel 2.6.x			
Software	Windows	Server2003, Server2008			
	Boot	PXE, iSCSI			
	Power Consumption	+3.3V	VPWR (+5V)		
Power	Does not include FOT	0.25A may	1.54 may		
	Transceivers		1.5A max		
		Operating	Non-Operating		
Environment	Temperature	0 ~ 60° C (32 ~ 140° F)	-40 ~ 80° C (-40 ~ 176° F)		
	Humidity	95 % @ 40° C, non-condensing	95 %@ 60° C, non-condensing		
Physical Characteristics	Dimensions (W x D)	74 x 149 mm (2.9" x 5.78")			
	Weight	0.104 kg (0.23 lbs)			
Compliance	IEEE Std 1386.1-2001 PMC spec	ification			
Compliance	VITA 42.0-2005, 42.3-2006 XMC	specifications			

#### **Recommended Configurations**

XMC Extension Board	CPU Board
MIC-3312-A1E	MIC-3393B-M2E, MIC-3395

## **Ordering Information**

Part Number	Description
MIC-3666-AE	XMC with dual SFP+ 10GbE interfaces



MIC-3666-AE

## 6U CompactPCI® Dual PMC or CMC Carrier Board (64-bit/66 MHz)



#### **Features**

- 64-bit, 66 MHz CompactPCI® interface
- Supports dual PMC module
- Onboard PCI-to-PCI bridge
- Compliant with CMC specification

### Introduction

The MIC-3951 is a 6U CompactPCI carrier board for PCI Mezzanine Cards (PMC) modules. It provides two 64-bit PMC sites for easy CompactPCI system expansion through different PMC modules. An Intel<sup>®</sup> 21154 PCI-to-PCI bridge chip is used in the MIC-3951 for CompactPCI bus expansion and decreases the CompactPCI bus loading to one, in addition to meeting industry requirements. Advantech provides several PMC modules that work in conjunction with the MIC-3951, such as the inclusive 10/100 Ethernet module and Gigabit module. In addition to being compatible with Advantech CompactPCI products, the MIC-3951 can also be used with other standardized, off-the-shelf modules from other manufacturers.

## **Specifications**

Due	PCI	From 32-bit/33 MHz up to 64-bit/66 MHz	
Bus	PCI-to-PCI Bridge	Intel 21154	
Power	Power Consumption	2.2 W @ 64 bit/66 MHz (670 mA @ +3.3 V)	
		Operating	Non-Operating
Environment	Temperature	0 ~ 60 °C (32 ~ 140 °F)	-20 ~ 80 °C (-4 ~ 176 °F)
EITVITOTITIETIL	Humidity	-	5 ~ 95 % @ 60 C, non-condensing
	Vibration (5 ~ 500 Hz)	1.0 Grms	2.0 G
Physical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.2" x 6.3"), 1-slot width	
Filysical Glialacienstics	Weight	0.5 kg (1.10 lb)	
Reliability	Mean-Time-To-Repair (MTTR)	5 minutes	
	PICMG 2.0 R3.0 CompactPCI Spe	ecification	
Compliance	PICMG 2.3 R1.0 CompactPCI PM	C I/O Mapping Specification	
	IEEE P1386.1 R2.3 PMC Specifica	ation	

## **Recommended Configurations**

PMC Carrier Board	PMC Module
MIC-3951	MIC-3665-AE MIC-3665-BE

## **Ordering Information**

Part Number	Description
MIC-3951-AE	6U CompactPCI dual PMC carrier board (64-bit/66 MHz)

Note: Please contact your local distributor for more information on CMC solution



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RoHS

## **6U CompactPCI® Media Carrier Board**



#### **Features**

- Expands Advantech chassis MIC-3042B series chassis storage capacity
- Accommodates a slim CD-ROM



### Introduction

The MIC-3960 is a 6U-high 1-slot CompactPCI media carrier board, with one slim CD-ROM. Designed to be highly cost-effective and simple to use, the MIC-3960 adds value to any CompactPCI system. It can easily expand storage capacity once placed in Advantech's MIC-3042B series enclosures.

## **Specifications**

Storage Space	Slim CD-ROM	1	
Power	Power Consumption	1 W	
		Operating	Non-Operating
Environment	Temperature	0 ~ 60° C (32 ~ 122° F)	-40 ~ 60° C (-40 ~ 140° F)
Environment	Humidity	-	95 % @ 60 °C, non-condensing
	Vibration (5 ~ 500 Hz)	1.0 Grms	2.0 G
Physical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.2" x 6.3"), 1-slot width	
Physical Gharacteristics	Weight	0.5 kg (1.10 lb)	
Reliability	Mean-Time-To-Repair (MTTR)	5 minutes	
Compliance	PICMG 2.0 R3.0 CompactPCI Spe	cification	

## **Recommended Configurations**

Enclosures	Board	Rear I/O Board
MIC-3042B series	MIC-3390, MIC-3392, MIC-3393 series	RIO-3309, RIO-3310, RIO-3311 series

## **Ordering Information**

Part Number	Description
MIC-3960-AE	6U CompactPCI media carrier board

Storage space for a slim-type CD-ROM

### **6U CompactPCI® PCI Carrier Board**



#### **Features**

- 64-bit PCI interface
- 5 V only
- 33/66 MHz PCI clock selectable
- Hold-down bracket to secure PCI board



The MIC-3961 is a 6U CompactPCI<sup>®</sup> PCI carrier board that allows users to attach a 32/64-bit PCI card via a J1/J2 connector to a CompactPCI platform. The hold-down bracket secures the PCI card onto the carrier board and protects it against vibration and shock. In addition, the bracket allows a cable to be routed through the front slot panel.

## **Specifications**

Bus	PCI	32-bit/33 MHz, 64-bit/66 MHz	
Power	Power Consumption	1 W @ 33 MHz	
		Operating	Non-Operating
Environmont	Temperature	0 ~ 60° C (32 ~ 140° F)	-20 ~ 80° C (-4 ~ 176° F)
EIIVIIOIIIIIeIIL	Humidity	-	5 ~ 95 % @ 60° C, non-condensing
	Vibration (5 ~ 500 Hz)	1.0 Grms	2.0 G
Dhysical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.2" x 6.3"), 1-slot width	
Physical Characteristics	Weight	0.6 kg (1.32 lb)	
Reliability	Mean-Time-To-Repair (MTTR)	5 minutes	
Compliance	PICMG 2.0 R3.0 CompactPCI Spe	ecification	

### **Recommended Configurations**

PCI Carrier Board	Enclosure
MIC-3961-AE	MIC-3042, MIC-3043 series

Note: Because of the PCI slot form factor, it can not support 3.3 V PCI card.

## **Ordering Information**

Part Number	Description
MIC-3961-AE	6U CompactPCI PCI carrier board

Note: Please contact your sales distributor for the optional internal-to-panel cable adaptation assembly set.



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#### **3U CompactPCI® Rear Transition Board for MIC-3325**



#### **Features**

- External rear-panel interface connector for the MIC-3325 CPU board
- Supports VGA,LAN , USB 2.0, COM, SATA interface
- One VGA , one RJ-45 LAN, and two USB ports USB on the rear panel
- Two on board COM pin headers for RS-232
- One on-board SATA-II connectors



## Introduction

The MIC-3525 is the first Rear Transition Module (RTM) for MIC-3325. It supports: 1x VGA, 1x RJ-45 LAN, 2x USB on the rear panel and 2x on board COM pin headers for RS-232 and 1x on-board SATA-II connectors.

## **Specifications**

CompactPCI Connector	J2		
Power	Power Consumption		+5 V
			1.5A
		Operating	Non-Operating
Environment	Temperature	0 ~ 60° C (32 ~ 140° F)	-40 ~ 85° C (-40 ~ 185° F)
	Humidity	95% @ 40° C, non-condensing	95% @ 60° C, non-condensing
Dhygiaal Characteristics	Dimensions (W x H)	82 x 100 mm (3.3" x 3.95"), 1-slot width	
r nysicar chalacteristics	Weight	0.2 kg (0.44 lbs)	

## **Ordering Information**

Part Number		Rear Panel		On-board Header / Socket / Connector			or
	VGA	LAN	USB	COM	SATA	Slot Width	Conn.
MIC-3525-S1E	1	1	2	2	2	1	J2

## **Recommended Configurations**

Rear I/O Board	CPU Board
MIC-3525-S1E	MIC-3325, MIC-3326



## 6U CompactPCI® Extension Board for MIC-3393



#### **Features**

- Extension module for MIC-3393 CPU board
- Supports 2 XMC/PMC or 2 SATA interfaces



### Introduction

The MIC-3312 is an extension module for CPCI blades using dual slot (8HP) front panels. It can carry two XMCs/PMCs or two 2.5" Serial ATA HDDs/SSDs. Especially where the choice of CPU for the MIC-3393 and the thermal environment in the chassis mandate the use of an 8HP front panel for the MIC-3393, the MIC-3312 can be used as a very efficient way to support enhanced I/O modularity and additional mass storage options. Using dual HDDs or SSDs on MIC-3312-A2E can provide integrated storage with RAID support using the ICH9R's features on the MIC-3393. Adding PMCs and XMCs on the MIC-3312-A1E, such as the MIC-3665 dual GbE PMC or an 10GE XMC Module can be used to extend port count or enhance the CompactPCI platform to add 10Gigabit Ethernet connectivity. With the advent of quad Core processors on the MIC-3393, there is also sufficient CPU power to support high speed connectivity on CompactPCI.

## **Specifications**

CompactPCI Connector	J1		
XMC	Interface	PCIe x8	
PMC	Interface	PCI-X 64-bit/66 MHz	
	MIC-3312-A1E	+3.3V	-
Power Concumption	(without XMC/PMC)	1.5A	-
Power Consumption	MIC-3312-A2E	-	+5V
	(with SATA HDD*2)	-	2A
		Operating	Non-Operating
Environment	Temperature	0 ~ 55° C (32 ~ 122° F)	-40 ~ 85° C (-40 ~ 185° F)
	Humidity	95 % @ 40° C, non-condensing	95 % @ 60° C, non-condensing
Physical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.2" x 6.3"), 2-slot width (MIC-339	3 + MIC-3312)
	Weight	0.2 kg (0.44 lbs) (MIC-3312)	

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## **Recommended Configurations**

Extension Module	CPU Board	Part Number	On-board Header/Socket/Connecto		
MIC-3312-A1E	MIC-3393B-M2E	Part Number	XMC/PMC	SATA HDD	
MIC-3312-A2E	MIC-3393C-M2E	MIC-3312-A1E	2	-	
				0	



MIC-3312-A1E

## **Ordering Information**

Dort Number	On-board Header/Socket/Connector		
Fart Number	XMC/PMC	SATA HDD	
MIC-3312-A1E	2	-	
MIC-3312-A2E	-	2	



MIC-3312-A2E

## 6U CompactPCI® Extension Board for MIC-3393



#### **Features**

- Extension module for MIC-3393 CPU board
- Supports 1 VGA display port
- On-board S3 GPU
- On-board 256 MB DDR2 memory
- PCIe x8 interface

### Introduction

The MIC-3313 is an extension module for CPCI blades using dual slot (8HP) front panels. It can support one VGA display output. Especially where the choice of CPU for the MIC-3393 and the thermal environment in the chassis mandate the use of an 8HP front panel for the MIC-3393, the MIC-3313 can be used as a very efficient way to support display solutions. An on-board S3 435ULP low power GPU and 256MB DDR2 memory on MIC-3313 allows it to support high performance display solutions for MIC-3393. If further combined with RIO-3313, the CPCI system can support dual display.

## **Specifications**

CompactPCI Connector	J1, J5		
XTM	Interface	PCIe x8	
GPU	S3	435ULP	
Memory	DDR2	256 MB	
Dower Concumption	MIC-3313-A1E	+3.3 V	+5 V
		0.21 A	1.89 A
		Operating	Non-Operating
Environment	Temperature	0 ~ 55° C (32 ~ 122° F)	-20 ~ 80° C (-4 ~ 176° F)
	Humidity	85 % @ 40° C, non-condensing	95 % @ 60° C, non-condensing
Physical Characteristics	Dimensions (W x D)	233.35 x 160 mm (9.2" x 6.3"), 2-slot width (MIC-339	3 + MIC-3313)
FILYSICAL CHALACTERISTICS	Weight	0.2 kg (0.44 lbs) (MIC-3313)	



## **Recommended Configurations**

Extension Module CPU Board MIC-3313-A1E MIC-3393D Series

Series MIC-3042, MIC-3043 Series

## **Ordering Information**

Dort Number	On-board Header/Socket/Connector		
Part Number	VGA	Slot Width	Conn.
MIC-3313-A1E	1	1	J1,J5





#### CompactPCI<sup>®</sup> Intel<sup>®</sup>ligent Chassis Management Module (PICMG<sup>®</sup> 2.9)



#### **Features**

- Compatible with PICMG 2.1, 2.16, and 2.9-compliant components
- Monitors via the Intel®ligent Platform Management Bus (IPMB) protocol
- Provides isolated IPMI signals for each slot for maximum security and reliability
- Out-of band management interface
- Hot swap support for IPMI based field replaceable components
- Alarm cut off push button on the front panel
- Standalone system monitoring: no driver needed, independent OS



### Introduction

The MIC-3927 is a proprietary form factor Chassis Management Module (CMM) intended for use with PICMG\* 2.1, 2.16, and 2.9-compliant systems (the CompactPCI\* Hot Swap, Packet Switching Backplane, and System Management specifications respectively). The MIC-3927 plugs into a dedicated slot in compatible systems. It provides centralized management and alarm notification for system power supplies and fans as well as single board operation status. The CMM may be paired with a backup for high-availability applications.

The MIC-3927 is essentially a special-purpose single board computer with a CPU, some memory, a PCI bus, an operating system and peripherals. The MIC-3927 monitors and configures IPMI-based components in the chassis. When the thresholds for temperature and voltage limitations are reached or when failure occurs, the CMM will capture an event. At the same time, the MIC-3927 sends SNMP traps and drives the Telco alarm relays that trigger onboard LEDs. The CMM can query FRU information (such as serial number, model number, manufacture date, etc.), detect presence of components (such as fan tray, CPU board, etc.), and monitor the status of each component.

The MIC-3927 also has a built-in Web-based administration interface that allows users to monitor the system's operation from any place with Internet connectivity. The MIC-3927 adds another dimension to the reliability of your most critical applications.

\*IPMI function only supported for MIC-3392 and MIC-3395

## **Sensor Specifications**

Voltage	Input	+3.3 V <sub>DC</sub> , +5 V <sub>DC</sub> , -5 V <sub>DC</sub> , +5 V <sub>SB</sub> , +12 V <sub>DC</sub> , -12 V <sub>DC</sub> , VBat
	Input	1 (onboard)
Tomporaturo	Sensor	Thermistor
Temperature	Interface	12C
Rin Speed In Ring Ring Ring Ring Ring Ring Ring Rin	Range	-40 ~ 120° C (-40 ~ 248° F)
Ean Spood	Input	9
ran speeu	Range	700 ~ 10000 rpm
Dewer Cood	Input	4
Fower doou	Range	High > 2.4 $V_{DC}$ , Low < 0.8 $V_{DC}$
	Interface	12C
CPU Board Health	Input	CPU VCore, CPU fan, CPU temperature (up to 2 CPUs), DC +5 V, DC -5 V, V (I/O), DC +12 V, DC -12 V
	Max. SBC Monitoring	8 boards
Digital Input/Output (optional)	Input	4
	Output	4

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## **Hardware Specifications**

	CPU	RDC2880					
Processor System	Firmware	2 MB Embedded Flash ROM					
	Memory	2 MB SRAM					
Ethernet	Interface	10/100 Mbps					
Sorial Port	Interface	RS-232					
Serial Full	Baud Rate	9600 bps					
	Buzzer support	Yes					
Miscellaneous	Time-out Signal for watchdog timer detection	Yes					
	Charge Time	24 hr					
Pattery	Battery Type	Ni-MH					
Dallely	Capacity	1500 mA-H (full charged, for 15~20 minutes operat	ion, depending on the system configuration)				
	Battery Life	80% capacity @ 20° C after 1000 cycles of charge and discharge					
Power Requirement	Typical	5 V @ 550 mA					
		Operating	Non-Operating				
Environment	Temperature	0 ~ 60° C (-32 ~ 140° F)	-20 ~ 70° C (-4 ~ 158° F)				
	Humidity	-	5 ~ 95 % RH, non-condensing				
Physical Characteristics	Dimensions (W x D)	Kernel module: 40.5 x 93 mm (1.6" x 3.7") Carrier module: 100 x 95 mm (3.9" x 3.7")					

## **Firmware Specifications**

System Status Manitaring and	Real-time system status monitoring: provides real-time status display in HTTP/Java graphical format					
System Status Monitoring and	Monitor the temperature, fan speed and system voltage					
Management	Alarm event record display					
	E-mail: can setup up to 4 addresses to receive notification e-mails					
Alarm Notification	Audible alarm sound					
	SMS support for receiving short message through mobile phone					
Supported Protocol	TCP, UDP, IP, ICMP, DHCP, BOOTP, ARP, SNMP, HTTP, Telnet					
	Web-based remote configuration, control and monitor					
Management Eurotion	Firmware upgrade from serial port and Ethernet port					
Inanayement Function	Supports Time Sync with system board					
	The SSL and SSH secure communications across Internet					

## **Ordering Information**

Part Number	Description
MIC-3927AE	MIC-3927 alarm module for MIC-3056, MIC-3081
MIC-3927CE	MIC-3927 alarm module for MIC-3042, MIC-3043



RS-232 COM port LAN port



## **RIO-3310**

#### 6U CompactPCI® Rear Transition Boards for MIC-3390 and MIC-3392



#### **Features**

- External rear-panel interface connectors for CPU boards
- Ultra 320 SCSI interface
- Supports SATA interface



#### Introduction

The RIO series of rear transition boards provide rear-panel access to the I/O interfaces of Advantech's CompactPCI CPU boards. RIO-3310S/3310A/3310B is designed for the MIC-3390 and MIC-3392 series.

## **Specifications**

CompactPCI Connector	RIO-3310S: J1/J2/J3/J5; RIO-3310A: J3/J5; RIO-3310B: J3/J5							
SCSI Controller	RIO-3310S: Adaptec AIC-7901 ultra 320 SCSI control chip supports RAID 0, 1, 10							
SATA RAID Port Multiplier	RIO-3310B: JMicron JMB390 SATA II Port Multiplier supports RAID 0, 1, JBOD							
Power	Power Consumption	+3.3 V	+5 V	+12 V				
Power	3 A 2 A	1 A						
		Operating		Non-Operating				
Environment	Temperature	0 ~ 60° C (32 ~ 140° F)		-20 ~ 80° C (-4 ~ 176° F)				
	Humidity	-		5 ~ 95%, non-condensing				
Physical Characteristics	Dimensions (W x D)	233.35 x 80 mm (9.2" x 3.15"), 1	I-slot width					
rnysical characteristics	Weight	0.4 kg (0.88 lb)						



RIO-3310S-A1E



RIO-3310BE

## I/O Interfaces

1/0		Connector		Interface Location			
I/U	RIO-3310S	RIO-3310A	RIO-3310B	RIO-3310S	RIO-3310A	RIO-3310B	
Keyboard	J5	J5	J5	Rear panel	Rear panel	Rear panel	
Mouse	J5	J5	J5	Rear panel	Rear panel	Rear panel	
COM1	J5	J5	J5	Rear panel	Rear panel	Rear panel	
FDD	J3	J5	J3	Internal	Internal	Internal	
IDE	J3/J5	J3/J5	J3	Internal	Internal	Internal	
FE LAN	J5	J5	J5	Rear panel (optional)	Rear panel (optional)	Rear panel	
GbE LAN	J5	J5	J5	Rear panel	Rear panel	Rear panel	
USB	J5	J5	J5	Rear panel	Rear panel	Rear panel/Internal	
VGA	J5	J5	J5	Rear panel	Rear panel	Rear panel	
COM2	J5	J5	J5	Rear panel	Rear panel	Rear panel	
Ultra 320 SCSI (controller chip on board)	J1/J2	-	-	Internal	-	-	
Parallel	J3	J3	J3	Internal	Internal	Internal	
SATA	-	-	J3/J5	Internal	Internal	Internal	

## **Ordering Information**

	Rear Panel						On-board Header						
Part Number	Koyhoard	Mouso	COM	IICR	LAN	VGA	12.72	IICD	1272	IDE	EDD	Darallal	C ATA
	Keybuaru	MOUSE	COM	030	LAN	VUA	3031	030	3031	40-pin	100	raialiei SAIA	
RIO-3310S-A1E	1*	1*	2	1	2 (GbE)	1	-	1	1	1	1	1	-
RIO-3310S-A2E	1*	1*	2	1	2 (GbE)	1	1	1	-	1	1	1	-
RIO-3310AE	1*	1*	2	1	2 (GbE)	1	-	1	-	1	1	1	-
RIO-3310BE	1*	1*	2	1	2 (GbE) 1 (10/100)	1	-	1	-	1	1	1	3**

\*Note: Y cable is included.

\*\*Note: Among three SATA connectors, two are used for RAID function.
## 6U CompactPCI® Rear Transition Board for MIC-3393



#### Features

- External rear-panel interface connectors for the MIC-3393 CPU board
- Supports SAS, SATA, USB2.0, COM, and PS/2 interfaces
- One USB header for USB NAND Flash Module
- Three RJ-45 GbE ports on the rear panel
- One VGA port on the rear panel
- One Mini-SAS port on the rear panel



#### Introduction

The RIO-3311 is the first Rear Transition Module (RTM) supporting PCIe connectivity to the main CPCI board enabling significant value-added features and extensions to next generation CPCI blades such as the MIC-3393. The RIO-3311 supports one PS/2 port, 3 USB ports, two RS-232 ports, 2 SATA ports, a PCIe based server graphics controller with VGA port and alternate cabling for the three Gigabit Ethernet ports. Two versions of the RIO-3311 provide a choice of storage options. The RIO-3311-A2E supports SATA disk drives and SATA RAID via the ICH9R. When higher performance and reliability is required, the RIO-3311-A1E supports a 4-port SAS controller with RAID and failover support.

#### **Specifications**

CompactPCI Connector	J1/J3/J5					
SAS Controller	Controller	LSISAS1064E SAS controller chip supports 3Gb/s S	AS / SATA data transfer and RAID			
	Controller	XGI Volari Z11				
Graphics	VRAM	32 MB				
	Resolution	Up to 1600 x 1200, 64 K hi-color at 70 Hz				
Dower	Power Consumption	+3.3 V	+5 V			
Powei		1.5 A	1.5 A			
		Operating	Non-Operating			
Environment	Temperature	0 ~ 55° C (32 ~ 122° F)	-40 ~ 85° C (-40 ~ 185° F)			
	Humidity	95% @ 40° C, non-condensing	95 %@ 60° C, non-condensing			
Rhyging Characteristics	Dimensions (W x D)	233.35 x 80 mm (9.2" x 3.15"), 1-slot width				
Physical Unaracteristics	Weight	0.3 kg (0.66 lbs)				

#### **Recommended Configurations**

Rear I/O Board	CPU Board
RIO-3311-A1E, RIO-3311-A2E	MIC-3393A, MIC-3393B, MIC-3393C Series

#### **Ordering Information**

Dort Number			Rear	Panel			On-board Header/Socket/Connector						
Part Nulliver	LAN	COM	VGA	PS/2*	USB	MiniSAS	USB	USB Flash**	SATA	SAS (SATA interface)	Slot Width	Conn.	
RIO-3311-A1E	3	2	1	1*	2	1	1	-	2	4	1	J1,J3,J5	
RIO-3311-A2E	3	2	1	1*	2	-	1	1	2	-	1	J1,J3,J5	

\*Note: One PS/2 port carries the signals for both K/B and mouse. Y cable is included. \*\*Note: Use of Advantech EmbCore USB 2.0 Disk Module (Type C) recommended

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#### 6U CompactPCI® Rear Transition Board for MIC-3313



#### **Features**

- External rear-panel interface connectors for the MIC-3313 XTM board
- Supports VGA, DVI-D interfaces
- One SATA connector

#### Introduction

The RIO-3313 is the RTM module supporting MIC-3313 XTM VGA module. The combination of RIO-3313 and MIC-3313 can achieve dual display solution for MIC-3393 CPCI blade. The RIO-3313 supports two DVI-D ports, one VGA port, and one SATA connector.

#### **Specifications**

CompactPCI Connector	J5		
Graphics	Interface	VGA2, DVI1, and DVI2	
		Operating	Non-Operating
Environment	Temperature	0 ~ 55° C (32 ~ 122° F)	-20 ~ 80° C (-4 ~ 176° F)
	Humidity	85 % @ 40° C, non-condensing	95 % @ 60° C, non-condensing
Physical Characteristics	Dimensions (W x D)	233.35 x 80 mm (9.2" x 3.15"), 1-slot width	
	Weight	0.3 kg (0.66 lbs)	





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#### **Recommended Configurations**

Rear I/O Board	CPU Board	Enclosure
RIO-3313-A1E	MIC-3393D Series	MIC-3042, MIC-3043 Series

#### **Ordering Information**

Part Number	Rear Panel		On-board Header/Socket/Connector					
	VGA	DVI-D	SATA	Slot Width	Conn.			
RIO-3313-A1E	1	2	1	1	J5			

#### 6U CompactPCI® Rear Transition Board for MIC-3395



#### **Features**

- External rear-panel interface connector for the MIC-3395 CPU board
- Supports SAS, SATA, USB 2.0, COM and PS/2 interfaces
- One USB header for USB NAND flash module
- Two RJ-45 GbE ports on the rear panel
- One Digital and One analog DVI port on the rear panel
- One MiniSAS port on the rear panel (for RIO-3315-A1E)
- Two PICMG 2.16 LAN ports on the rear panel (for RIO-3315-C1E)



#### Introduction

The RIO-3315 is the first Rear Transition Module (RTM) supporting PCIe connectivity to the main CPCI board enabling significant value-added features and extensions to next generation CPCI blades such as MIC-3395. The RIO-3315 supports: one PS/2 port, six USB ports, two RS-232 ports, two SATA ports, two Gigabit Ethernet ports, one digital and one integrated (digital/analog) DVI port. Three versions of RIO-3315 provide a choice of storage and LAN options. The RIO-3315-A1E with LSI1064E SAS controller supports a 4-port SAS controller with RAID, which allows switching between four internal SAS/SATA or four external MiniSAS ports. The RIO-3315-B1E supports SATA disk drives and SATA RAID via the QM67 PCH. An additional DSUB COM port is placed on rear panel. The RIO-3315-C1E provides two GbE LAN ports and two PICMG 2.16 LAN ports on the rear panel.

#### **Specifications**

CompactPCI Connector	J3 / J4 / J5											
SAS Controller	LSI1064E SAS Controller chip supports 3 Gb/s SAS/SATA data transfer and RAID											
Dowor	Power Consumption	+3.3 V	+5 V									
FUWEI		3 A	2 A									
		Operating	Non-Operating									
Environment	Temperature	0 ~ 60° C (32 ~ 140° F)	-40 ~ 85° C (-40 ~ 185° F)									
	Humidity	95 % @ 40° C, non-condensing	95 % @ 60° C, non-condensing									
Physical Characteristics	Dimensions (W x D)	233.35 x 80 mm (9.2" x 3.15"), 1-slot width										
	Weight	0.3 kg (0.66 lbs)										

#### **Recommended Configurations**

Rear I/O Board	CPU Board
RIO-3315-A1E	MIC-3395A, MIC-3395B, MIC-3395C Series
RIO-3315-B1E	MIC-3395A, MIC-3395B, MIC-3395C Series
RIO-3315-C1E	MIC-3395A, MIC-3395B, MIC-3395C Series

#### **Ordering Information**

	Rear Panel									On-board Header/Socket/Connector							
Part Number	LAN	PS/2*	COM (RJ-45)	COM (DB9)	USB	DVI-D	DVI-I	MiniSAS	USB	VGA	СОМ	SATA	SAS (SATA Interface)	Slot Width	Conn.		
RIO-3315-A1E	2	1	1	-	2	1	1	1	2	1	1	2	4	1	J3, J4, J5		
RIO-3315-B1E	2	1	1	1	2	1	1	-	2	1	-	2	-	1	J3, J4, J5		
RIO-3315-C1E	4	1	1	-	2	1	1	-	2	1	1	2	-	1	J3, J4, J5		

\*Note: One PS/2 port carries the signals for keyboard and mouse. A "Y" cable is included.

\*\*Note: The use of Advantech's EmbCore USB 2.0 Disk Module (Type C) is recommended.

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# **RIO-3392MIL**

#### 6U CompactPCI® Rear Transition Board for MIC-3392MIL



#### **Features**

- External rear-panel interface connectors for the MIC-3392MIL CPU board
- On-board battery
- Supports SATA, IDE, FDD, LPT, USB2.0, COM, and audio interfaces
- Four RJ-45 ports on the rear-panel
- Two DVI-I ports on the rear panel



#### Introduction

RIO-3392MIL is designed specifically for the MIC-3392MIL series. It contains a rich variety of I/O interfaces and ports on the external rear panel, extending the functional features of MIC-3392MIL.

#### **Specifications**

CompactPCI Connector	J3/J4/J5		
		Operating	Non-Operating
Environment	Temperature	-40 ~ 70° C (-40 ~ 158° F)	-50 ~ 80° C (-58 ~ 176° F)
	Humidity	5 ~ 85 % @ 45° C, non-condensing	10 ~ 95 % @ 45° C, non-condensing
Physical Characteristics	Dimensions (W x D)	233.35 mm x 80 mm (9.2" x 3.15"), 1-slot width	
FIIYSICAI GIIAIACIEIISIICS	Weight	0.305 kg (0.672 lbs)	

#### **Recommended Configurations**

Rear I/O Board	CPU Board	Enclosure
RIO-3392MIL-AxE Series	MIC-3392MILS-PxE Series	MIC-3039-BE, MIC-3042A/B, MIC-3043A/B/C/D, MIC-3056A, MIC-3081B
RIO-3392MIL-AxE Series	MIC-3392MILC-PxE Series	Customized conduction cool enclosure

#### **Ordering Information**

	Rear Panel						On-board Header/Socket/Connector							Conformal
Part Number	LAN	СОМ	DVI-I	PS2	USB	IDE	FDD	LPT	SATA	COM Interface	Console Interface	USB Interface	Conn.	Coating
RIO-3392MIL-A1E	4	1	2	1	2	1	1	1	2	1	1	2	J3 ~ J5	-
RIO-3392MIL-A2E	4	1	2	1	2	1	1	1	2	1	1	2	J3 ~ J5	V





Note: final production will not contain J1 and J2 connectors.

## **MIC-3042**

#### 4U CompactPCI® Enclosure with cPCI Power Supply (CT Bus non-CT Bus or PICMG 2.16)



#### **Features**

- 8-slot 6U CompactPCI<sup>®</sup> backplane
- AC cPCI 500 W + 250 W redundant (2+1) power supplies
- PICMG 2.16 (CompactPCI Packet Switching Backplane) compliance
- PICMG 2.5 (CompactPCI Computer Telephony) compliance



#### Introduction

The MIC-3042 is a 4U enclosure designed for standard cPCI power supplies. It is equipped with a cPCI 500 W redundant 2+1 power supply with hot-swap support. The system has 8 slots for CompactPCI boards and 6 slots for IEEE 1101.11 rear I/O transition boards. The MIC-3042 comes with a built-in high quality backplane that supports 64-bit / 66 MHz PCI cards. The standard configuration includes a H.110 CT Bus that complies with PICMG 2.5, which is the open architecture used to build telecom solutions.

-						
		MIC-3042A	MIC-3042B	MIC-3042C		
		System x 1, Peripheral x 6,	System x 1, Peripheral x 6,	System x 1, Peripheral x 7,		
Backplane	6U Slot	Switch x 1, Rear transition x 8	Media x 1, Rear transition x 7	Rear transition x 8		
		(80 mm, IEEE1101.11 compliant)	(80 mm, IEEE1101.11 compliant)	(80 mm, IEEE1101.11 compliant)		
	Bus	Up to 64-bit/66 MHz PCI bus				
	H.110 CT Bus	Yes	Yes	No		
	V (I/O)	+3.3 V/+5 V (selectable)				
Cooling	Fan	2 (front: 193 CFM, rear: 61.3 CFM)				
	Input	AC 100 ~ 254 V @ 50 ~ 60 Hz, full ra	ange (MIC-3042X-A)			
	Output	AC cPCI 250 W redundant power module				
Power Supply		+3.3 V +5 V	+12 V	-12 V		
	Max. Load	36 A 50 A	10 A	1 A		
	Min. Load	0 A 2.0 A	0 A	0 A		
		Operating Non-Operating				
	Temperature	0 ~ 45° C (32 ~ 113° F)	-20 ~ 60° C (-4 ~ 1	40° F)		
Environment	Humidity	20 ~ 90% @ 40° C, non-condensing	10 ~ 95% @ 40° C	, non-condensing		
	Shock	10 G	30 G			
	Vibration (5 ~ 500 Hz)	1.0 Grms	2.0 G			
Rhypical Characteristics	Dimensions (W x H x D)	440 x 177 x 320 mm (17.3" x 7" x 12	6")			
FIIYSIGAI GIIAIAGUUIISUGS	Weight	18 kg (39.7 lb)				
Deliability	MTBF	Backplane	Fan module	Power supply		
nenability		800,000 hours	50,000 hours @ 25 °C	100,000 hours @ 70% load		
Serviceability	MTTR	5 minutes				
	PICMG 2.0 R3.0 CompactPCI	Specification				
	PICMG 2.1 R2.0 CompactPCI	Hot Swap Specification				
Compliance	PICMG 2.5 R1.0 CompactPCI	Computer Telephony Specification				
Compliance	PICMG 2.11 R3.0 Front-Acces	s Power Connectors Specification				
	PICMG 2.16 R1.0 CompactPCI Packet Switching Backplane Specification (MIC-3042B, MIC-3042C are not compliant with PICMG 2.16)					
	RoHS, CE, FCC, UL, CCC					

#### **Backplane Information**

Physical Number	Function
8	Switch slot
7	I/O slot
6	I/O slot
5	I/O slot
4	I/O slot
3	I/O slot
2	I/O slot
1	System slot

Physical Number	Function
8	I/O slot
7	I/O slot
6	I/O slot
5	I/O slot
4	I/O slot
3	I/O slot
2	System slot
1	Media blade slot

Physical Number	Function
8	I/O slot
7	I/O slot
6	I/O slot
5	I/O slot
4	I/O slot
3	I/O slot
2	I/O slot
1	System slot

MIC-3042A, PICMG 2.16 / CT backplane (for MIC-3042A series)

MIC-3042B, CT backplane (for MIC-3042B series)

MIC-3042C, non-CT backplane (for MIC-3042C series)

#### **Recommended Configurations**

Enclosure	CPU Board	Rear I/O Board	Chassis Management Module
MIC-3042AE MIC-3042A-AE MIC-3042BE MIC-3042B-AE	MIC-3392A-MxE, MIC-3392B-MxE, MIC-3392A2-MxE, MIC-3392B2-MxE, MIC-3392LE	RIO-3310S-A2E, RIO-3310BE	Included Ontional
MIC-3042CE MIC-3042C-AE	MIC-3392A-MxE, MIC-3392B-MxE, MIC-3392A2-MxE, MIC-3392B2-MxE, MIC-3392LE MIC-3395A1-M4E, MIC-3395A2-M4E, MIC-3395B1-M4E MIC-3395C1-M4E	RIO-3310S-A2E, RIO-3310BE RIO-3315-A1E, RIO-3315-B1E, RIO-3315-C1E	MIC-3924L-AE or MIC-3927CE

#### **Ordering Information**

Part Number	PICMG 2.16	PICMG 2.5	PCI	Switch Board Support	Media Blade Support	Chassis Management Module	cPCI Power Supply
MIC-3042AE	Yes	Yes	Yes	Yes	-	MIC-3924L-AE	-
MIC-3042A-AE	Yes	Yes	Yes	Yes	-	MIC-3924L-AE	AC cPCI 500 W + 250 W redundant (2+1)
MIC-3042BE	-	Yes	Yes	-	Yes	MIC-3924L-AE	-
MIC-3042B-AE	-	Yes	Yes	-	Yes	MIC-3924L-AE	AC cPCI 500 W + 250 W redundant (2+1)
MIC-3042CE	-	-	Yes	-	-	MIC-3924L-AE	-
MIC-3042C-AE	-	-	Yes	-	-	MIC-3924L-AE	AC cPCI 500 W + 250 W redundant (2+1)

#### **Optional Accessories**

Part Number	Description
1757000190G	One AC cPCI 250 W redundant power module
MIC-3927CE	MIC-3927 intelligent chassis management module (IPMI)



AC cPCI 500 W + 250 W redundant (2+1) power supplies



## **MIC-3043**

#### 4U CompactPCI® Enclosure with cPCI Power Supply and Removable HDD Bay (CT Bus or Non-CT Bus)



#### **Features**

- 6-slot 6U CompactPCI<sup>®</sup> backplane (CT or Non-CT Bus)
- Supports removable HDD bays (up to 2 3.5" SATA or up to 4 2.5" SATA/SAS drives)
- Built-in SATA slim-type DVD-RW/RAM
- AC cPCI 250 W + 250 W redundant (1+1) or 500W+250W (2+1) power supplies
- Supports hot-swappable fan modules
- PICMG 2.5 (CompactPCI Computer Telephony) compliance (MIC-3043D)
- Built-in alarm module (MIC-3924L-AE)



#### Introduction

The MIC-3043 is a 4U enclosure designed for mission-critical and high-reliability applications such as Networking, Telecommunication, Computer Telephony Integration, and Image Processing. It is equipped with a hot-swappable CompactPCI redundant power supply and hot-swappable fan modules to minimize MTTR (Mean-Time-to-Repair). The MIC-3043 supports six 6U CompactPCI blades and rear I/O transition boards. Users can route I/O signals to the rear transition boards for simplified system cabling. Front boards and RTMs can be swapped in and out the system without powering down. The MIC-3043 has removable SATA /SAS HDD bays and one slim DVD-RW as standard. The MIC-3043 has a high-quality backplane with impedance controlled design that supports 64-bit / 66 MHz cards. The H.110 CT Bus complies with PICMG 2.5, which is an open architecture ideal for telecom solutions.

		MIC-3043D	MIC-3043E		MIC-3043F (Preliminary)		
	6U Slot	System x 1, Peripheral x 5, Rear transition x 6 (80 mm, IEEE1101.11 compliant)					
Paololano	H.110 CT Backplane	Yes	-		-		
Баскріане	Backplane	32-bit/33 MHz, 64-bit/66 N	IHz CompactPCI Rev. 3.0, P	ICMG2.9			
	V (I/O)	+3.3 V/+5 V (selectable)					
Cooling	Fan	2 (front: 193 CFM, rear: 61.3 CFM)					
Drive Rev	HDD	2 (3.5" SATA1)	2 (3.5" SATA1)		4 (2.5" SAS /SATA or SSD)		
DIIVE Day	Slim DVD-RW/RAM	1	1		1		
Management Interface	Alarm Indicators	2 (fan failure and system ov	erheating)				
	Input	AC 100 ~ 240 V @ 50 ~ 60 Hz, full range (MIC-3043X-XX)					
	Output	AC cPCI 250 W redundant p	oower module (1+1 configu	ration)			
Power Supply		+3.3 V	+5 V	+12 V	-12 V		
	Max. Load	36 A	50 A	10 A	1 A		
	Min. Load	0 A	2.0 A	0 A	0 A		
Reliability	MTBF	Backplane	Power supply		FAN		
попарти		800,000 hours	100,000 hours @ 7	0%	80000 hours @ 40°		
		Operating		Non-Operati	ng		
	Temperature	0 ~ 45° C, (32 ~ 113° F)		-20 ~ 60° C,	(-4 ~ 140° F)		
Environment	Humidity	-		10 ~ 95% @	40° C, non-condensing		
	Shock	10 G		30 G			
	Vibration (5 ~ 500 Hz)	1.0 Grms*		2.0 G			
Physical Characteristics	Dimensions (W x H x D)	440 x 177 x 320 mm (17.3"	x 7" x 12.6")				
	Weight	18 kg (39.7 lb )					
	PICMG 2.0 R3.0 CompactPCI Spe	cification					
	PICMG 2.1 R2.0 CompactPCI Hot	Swap Specification					
Compliance	PICMG 2.11 R3.0 Front-Access P	ower Connectors Specification					
	PICING 2.5 KT.U CompactPCI Cor	nputer relephony Specificatio	n (IVIIC-3043D only)				
	ROHS, CE, FUU, UL, UUU						

#### **Backplane Information**

Physical Number	Function
6	I/O slot
5	System slot
4	I/O slot
3	I/O slot
2	I/O slot
1	I/O slot

MIC-3811, CT Bus backplane (for MIC-3043D)

MIC-3812, non-CT Bus backplane (for MIC-3043E, MIC-3043F)

#### **Recommended Configurations**

Enclosure	CPU Board	Rear I/O Board	Chassis Managem	ent Module
MIC-3043DE MIC-3043D-BE	MIC-3392A-MxE, MIC-3392B-MxE, MIC-3392A2-MxE, MIC-3392B2-MxE, MIC-3392LE	RIO-3310S-A1E, RIO-3310S-A2E, RIO-3310AE, RIO-3310BE		
MIC-3043EE MIC-3043E-BE	MIC-3392A-MxE, MIC-3392B-MxE, MIC-3392A2-MxE, MIC-3392B2-MxE, MIC-3392LE	RIO-3310AE, RIO-3310S-A2E, RIO-3310S-A1E, RIO-3310BE		
MIC-3043FE (Preliminary) MIC-3043F-BE	MIC-3392A-MxE, MIC-3392B-MxE, MIC-3392A2-MxE, MIC-3392B2-MxE, MIC-3393A-M2E MIC-3393B-M2E MIC-3393C-M2E MIC-3393D-M2E MIC-3395A1-M4E MIC-3395A1-M4E MIC-3395B1-M4E MIC-3395C1-M4E	RIO-3310AE, RIO-3310S-A2E, RIO-3310S-A1E, RIO-3310BE RIO-3311-A1E RIO-3311-A2E RIO-3313-A1E RIO-3315-A1E RIO-3315-B1E RIO-3315-C1E	Included MIC-3924L-AE	Optional MIC-3927CE

#### **Ordering Information**

Part Number	PICMG 2.5	HDD Bay	Media Support	Chassis Management Module	cPCI Power Supply
MIC-3043DE	Yes	3.5" SATA x 2	Slim DVD-RW/RAM	MIC-3924L-AE	-
MIC-3043D-BE	Yes	3.5" SATA x 2	Slim DVD-RW/RAM	MIC-3924L-AE	Hot-swap AC cPCI 250 W + 250 W
MIC-3043EE	-	3.5" SATA x 2	Slim DVD-RW/RAM	MIC-3924L-AE	-
MIC-3043E-BE	-	3.5" SATA x 2	Slim DVD-RW/RAM	MIC-3924L-AE	Hot-swap AC cPCI 250 W + 250 W
MIC-3043FE Preliminary)	-	2.5" SATA/SAS HDD/SSD x4	Slim DVD-RW/RAM	MIC-3924L-AE	-
MIC-3043F-BE Preliminary)	-	2.5" SATA/SAS HDD/SSD x4	Slim DVD-RW/RAM	MIC-3924L-AE	Hot-swap AC cPCI 250 W + 250 W

Note: Please contact your local distributor to order AC 500W + 250W (2+1) redundant power suppliers.

#### **Optional Accessories**



## NCP-3105

#### **1U NodeB/RNC Appliance**



#### Features

- Entry Level Advantech Packetarium<sup>™</sup> -based network appliance
- Four GbE RJ-45 / Four GbE SFP dual mode capable ports
- Four RJ-45 ports with metallic bypass
- Synchronous Ethernet & IEEE1588v2 support (optional)
- -20° C to 65° C wide range temperature support (optional)
- Supports one SATA SSD
- -48 V<sub>DC</sub> power supply with redundant input feeds
- NEBS Level 3 design compliant

#### Introduction

The NCP-3105 represents the entry level Advantech Packetarium™ Network Appliance. It integrates powerful and multi-core Packetarium™ network processing cards for wire speed packet processing. The main carrier board provides 4 x GbE RJ-45 / 4 x GbE SFP dual-mode capable ports. A user can define the default Ethernet interface to go to either the RJ-45 ports or the SFPs. The RJ-45 ports also provide metallic bypass function. The dual -48 V<sub>DC</sub> power input design is particularly applicable for Telecom NodeB and RNC infrastructures.

#### **Specifications**

Processor Memory		Depends on Packetarium card		
Network Interface	Data Ports	4 x GbE RJ-45 / 4 x GbE SFP with dual-mode capable ports		
	Management Port	1 x GbE RJ-45 port		
Hardware	Controller	Winbond W83793G		
Storage	SATA	1 x 2.5" SATA 2 SSD (optional)		
I/O Interface	Serial Port	1 x RJ-45 type console port		
Dawar	Type/Watts	DC/ 200W+200W redundant input feeds		
FUwei	Input	-48 V <sub>DC</sub>		
Cooling	Fan	5 x fans		
	Operating	Temperature: 0 to 40° C		
Environment	Operating	Humidity: 20% to 90% RH		
Environment	Storage	Temperature: -20 to 70° C		
	Storage	Humidity: 5% to 95% RH		
Physical Characteristics	Dimensions (W x H x D)	440 x 44 x 254 mm (17.3" x 1.7" x 9.9")		
T HYSICAL CHALACLEHSLICS	Weight	4.5 kg		

#### Packetarium™ Card Specification

Packetarium Card NCPB-2305 Cavium OCTEON II	Cavium OCTEON II CN6335-AAP-1.3 GHz
	2 x DDR3 DIMMs up to 16 GB
	2 x 128 MB boot flash



#### **Ordering Information**

Part Number	Packetarium Card Inside	Operating Temperature	Sync-E & IEEE1588v2
NCP-3105-F3D0AE	NCPB-2305 (OCTEON II CN6335-AAP-1.3 GHz)	0 to 40° C	-
NCP-3105-F3D1AE	NCPB-2305 (OCTEON II CN6335-AAP-1.3 GHz)	0 to 40° C	Yes
NCP-3105-F3D2AE	NCPB-2305 (OCTEON II CN6335-AAP-1.3 GHz)	-20 to 65° C	-
NCP-3105-F3D3AE	NCPB-2305 (OCTEON II CN6335-AAP-1.3 GHz)	-20 to 65° C	Yes

## NCP-3120

#### 1U 1-Way Packetarium™ Network Processor Platform



#### **Features**

- Entry level Advantech Packetarium<sup>™</sup> based Network Appliance
- FRU-designed I/O tray, supports different external Ethernet I/O
- Supports up to eight SATA 2 SSDs
- One Standard PCIe Expansion

#### Introduction

The NCP-3120 represents the entry level Advantech Packetarium<sup>™</sup> Network Appliance. It integrates powerful and multi-Core Packetarium<sup>™</sup> network processing cards for wire speed packet processing. The main carrier board provides eight SATA controllers, an eight lane PCI Express Gen2 expansion slot, and two I/O slots for FRU-designed I/O board usage. FRU-designed I/O board provides more flexibility than external I/O configuration. Each I/O slot can provide up to 20 Gigabits bandwidth.

Eight SATA controllers on the server board connect to eight SATA 2 devices. Each device with dedicated PCI Express bus provides high performance. The scalability of the NCP-3120 positions it ideally for OEMs designing entry level systems in enterprise networking. It is particularly applicable for applications in service provider networks for IPTV, storage function, enhanced security, in content-aware routing and subscriber-based services.

#### **Main Carrier Board Specification**

Processor		Depends on Packetarium Card
Memory		Depends on Packetarium Card
Network Interface	I/O Board Information	4 x GE RJ-45 with Hardware Bypass 2 x 10GE SFP+
	Management Port	Up to 1 x GE RJ-45
HW Management	Controller	Winbond W83793G
Ctorago Suctom	Controller	8x Silicon Image Sil3132
Storage System	Storage Interface	Up to 8 x 2.5" SATA 2 SSDs
I/O Interface	Serial Port	1 x RJ-45 type console port
Expansion	Туре	1 x PCI Express x8 slot
Power	Type/Watts	AC: 275 W / DC: 275 W
	Input	AC: 100 ~ 240 V <sub>AC</sub> / DC: -36 ~ 72 V <sub>DC</sub>
Cooling	FAN	4 x fans
Environment	Operation	0 to 40° C , 20% to 90% RH
	Storage	-20 to 70° C, 5% to 95% RH
Compliance	EMC/Safety	CE/FCC/UL/CB/CCC

#### **Conceptual Front Panel**



#### **Ordering Information**

Part Number	Description
NCPB-2310	Cavium OCTEON CN5650 16 Cores 800Mhz 2 x PClex4 2 x XAUI
NCPB-2305	Cavium OCTEON II CN6335 6 Cores 1.3GHz 2 x PClex4 1 x XAUI
NCPB-2320	Cavium OCTEON II CN6880 32 Cores 1.3GHz 2 x PClex4 2 x XAUI

## NCP-5260

#### 3U Dual Xeon System with Dual Packetarium NPU slots



#### **Features**

- Packetarium™ Card module design.
- Hybrid design for Intel<sup>®</sup> IA architecture as control plane, and Packetarium Card as data plane
- Hybrid design to lower risk and shorter development schedule for SW
- 1 to 2 Packetarium<sup>™</sup> Card slots support
- Dual Intel<sup>®</sup> Xeon 5500 series support
- Sixteen 10 GbE external interfaces
- 10 GbE Switch w/ L2 switch management
- IPMI 2.0 HW Management
- Linux support
- FIPS Level 2 compliant



#### Introduction

The NCP-5260 represents a new generation of hybrid system designs with Intel<sup>®</sup> architecture processing on the control plane, and Packetarium™ network processing cards for the data plane. It integrates up to two powerful, multi-Core Packetarium™ network processing cards for wire speed packet processing and accomodates up to 16 x 10 GbE external interfaces. The main carrier board provides the high-speed switched interconnects between Packetarium cards. The Intel<sup>®</sup> Xeon-based server board provides storage, system-management and remote management network connections.

Each network processing card is linked by dual XAUI ports to a Broadcom 10 GbE switch on the carrier board. The 10 GbE switch provides sixteen front panel 10 GbE SFP+ ports. The carrier board incorporates a MPC8545 processor for overall switch management.

A SATA controller on the server board connects to two 2.5" SATA HDD slots.

The scalability of the NCP-5260 positions it ideally for OEMs designing high bandwidth systems in enterprise networking. It is particularly applicable for applications in service provider networks for enhanced security, in content-aware routing and subscriber-based services.

The initial Packetarium<sup>™</sup> network processing cards supported by the NCP-5260 are based on the RMI XLR 732 8-Core processor. Each processor supports up to 4 GB of memory on two DIMM sockets. Two PCIe x4 provide control plane connectivity with the carrier while two XAUI ports connect to the data plane. The card is designed with IPMI 2.0 H/W Management, remotely managed via a local Module Management Controller (MMC) connected to the carrier's IPMB-L (I<sup>2</sup>C) bus. A console port and a 1000 Mbps port provide further management interface options. Other network processing cards in the Packetarium family are compatible.

#### **Hybrid System Specifications**

Intel <sup>®</sup> x86 Server System		
Processor System	CPU Processor	2 x Intel Xeon Nehalem Quad-Core Processors (under 65W)
Custom Momonu	Memory Socket	12 x 240 pin DDR3 DIMM slots
System memory	Memory Type and Capacity	DDR3 800/1066/1333Mhz UDIMM/RDIMM up to 96 GB
I/O Bus	Interface	4 x PCIe x8 to I/O board
Ethernet Switch System		
Processor System	Local Management Processor	Freescale MPC8545 PowerQUICC III
FIDLESSOF SYSTEM	Max. Speed	1 GHz
System Memory	Memory Socket	200 pin SODIMM slot
System Memory	Memory Type and Capacity	Unbuffered 1 GB DDR2 667 MHz DIMM
Poot Elach	Boot Flash/Type	S29GL01GP11TFIR10 TSOP56
DUULFIdSII	Max Flash Size	1 Gbit
Natworking Interface	Ethernet Switch	Broadcom BCM56820 for 10 GbE
INCLIMUTINITY INCOME.	Ethernet Port	SFP+ (10 GbE/1 GbE) port x 16
Expansion	Packetarium Card Slot	2 Slots
	x86 Debug Port	RJ-45 RS-232 x 1
I/O Interface	x86 USB Port	TYPE-A USB 2.0 x 2
	x86 NIC Port	RJ-45 (10/100/1000 Mbps) x 1
Management Interface	Management Ethernet NIC	Intel 82574
Management intenace	Management Port	RJ-45 (10/100/1000 Mbps) x 1
Others		
Storage	Storage Interface	SAS/SATA HDD Tray x 2
Powor	Type/Watts	1 + 1 redundant hot-swappable/800 W
I OWEI	Input	AC 110 V <sub>AC</sub> to 240 V <sub>AC</sub> at 50-60 Hz

#### Hybrid System Specifications (Cont.)

Cooling	FAN	2 x hot-swappable fans
	Operating system	Linux Kernel 2.6
SW Support	HW Management	IPMI 2.0
	Switch Management	Broadcom FastPath
Physical Characteristics	Dimensions (W x H x D)	480 x 133.35 x 661.6 mm (18.90" x 5.25" x 26.05")
	Weight	about 30 kg
	Operating Environment	Temperature: 0 to 40° C
Environment		Humidity: 20% to 90% RH
Environment	Storage Temperatures	Temperature: -20 to 70° C
		Humidity: 5% to 95% RH
Compliance	EMC/Safety	CE/FCC/UL/CB (planned)
	FIPS	Level 2 compliant

#### **Packetarium™ Card**

#### NCPB-2410 RMI XLR

Packetarium Network Processing Card		
Processor System	Processor	Netlogic XLR732
	Max. Speed	1.2 GHz
	Processor Cores	8 Cores
System Memory	Memory Socket	Two 240-pin DDR2 DIMM slots
System Memory	Memory type and capacity	ECC registered DDR2 800 MHz DIMMs, up to 4 GB
Poot Elach	Redundant Boot Flash/Type	S29GL01GP11TFIR10 TSOP56
BOOL FIASI	Max Flash Size	1 Gbit
	Physical Connectioin	PCle x 1 + PCle x 16 Gold Fingers
Interface		Two PCIe x4
Internace	Logical Connection	Two XAUI
		One 1000 Mbps
Cooling	CPU Heatsink	Passive Aluminum Cooler
SW Support	Bootloader	Netlogic XLR SDK
	Operating System	Linux Kernel 2.6
Physical Characteristics	Dimensions (W x H)	245.6 x 148.6 mm (9.67" x 5.85")
	Weight	0.5 kg

#### **Ordering Information**

Part Number	Description
NCP-5260-FRA0E	NCP-5260 Chassis + x86 Server board + Main Ethernet Switch Board + 2 Packetarium Cards
NCPB-2410	Packetarium Card RMI XLR 732

## NCP-7560

#### 4U 8-way Packetarium<sup>™</sup> Network Processor Platform



#### Features

- Advantech Packetarium<sup>™</sup> design
- Scalable from 1 to 8 multi-Core Packetarium<sup>™</sup> network processing cards
- SAS/SATA controller for two AdvancedMCs with 2.5" storage devices
- Six 10GbE and sixteen 1GbE external interfaces
- L2 switch management
- PCIe Switch for control plane
- MicroTCA style hardware management
- Hot Swappable, 850 W redundant AC or DC power supplies
- Wind River CGL Linux and 6WINDGate<sup>™</sup> support
- Designed for NEBS 3.0



#### Introduction

The NCP-7560 represents the high performance end of Advantech's Packetarium™ product line. It integrates up to eight powerful, multi-Core Packetarium™ network processing cards for wire speed packet processing providing up to 80 Gbps throughput. The main carrier board provides high-speed switched interconnects between boards, along with storage, system management and external network connections.

Each network processing card is linked by dual XAUI ports to a Broadcomm BCM56820 10 GbE switch on the carrier board. The 10 GbE switch also provides six front panel 10 GbE SFP+ ports and sixteen GbE SFP ports via a Broadcomm BCM56512 GbE switch. An onboard SAS controller connects to two advanced mezzanine card slots for SAS/SATA 2.5" storage. The carrier board incorporates a MPC8545 local processor for overall switch and system management and provides two front panel 100BaseT ports for remote management. Debug ports are also made available for development of custom or application specific hardware.

The scalability of the NCP-7560 positions it ideally for OEMs designing high bandwidth systems in telecommunications and enterprise networking. It is particularly applicable for applications in service provider networks for enhanced security, in content-aware routing and subscriber-based services.

The initial Packetarium<sup>™</sup> network processing card are based on the Cavium Octeon CN5650 (12 Cores). Each card supports up to 16 GB of memory on four DIMM sockets. Two PCIe x4 slots provide control plane connectivity with the carrier while two XAUI ports connect to the data plane. The card is remotely managed via a local Module Management Controller (MMC) connected to the carrier's IPMB-L (I2C) bus. A console port and a 100 Mbps port provide further management interface options. Operating system support is available for the Cavium SDK, Linux Debian and Wind River PNE LE.

#### **Ethernet Switch System Specifications**

Processor System	Local Management Processor	Freescale MPC8545 PowerQUICC III
	Max Speed	1 GHz
System Memory	Memory Socket	200-pin SODIMM slot
System Memory	Memory type and capacity	Unbuffered 1 GB DDR2 667 MHz DIMM
Boot Flash	Flash Type	Redundant NOR Flash up to 256 MB
	Max Flash Size	256 MB
	Ethernet Switch	Broadcom BCM56820 for 10 Gb Broadcom BCM56512 for 1 Gb
Networking Interface	Ethernet Port	SFP+ (10 Gb/1 Gb) ports x 6
		SFP (1000BaseX) ports x 16
Management Interface	Management Ethernet Switch	Broadcom BCM53212
	Management Port	RJ-45 (1000 BaseT) x 1
Expansion	AMC Slot	2 mid-size, single width AMC modules supported (PICMG AMC.0)
	Packetarium Card Slot	8 slots
	Controllor	LSISAS1064e PCIe Gen1
Storage Subsystem	CONTROLLER	SAS/SATA HDD supportted
	Storage Interface	2 mid-size, single width SAS/SATA shared with AMC bay
		One Mini-SAS connector
	On Board USB	On board 8 GB NAND flash
I/O Interface	LMP Debug Port	RJ-45 RS-232 x 1
	Packetarium <sup>®</sup> Debug Port	TYPE-B USB 2.0 x 1
	LMP USB Ports	TYPE-A USB 2.0 x 2

#### **Ethernet Switch System Specifications (Cont.)**

Power	Type/Watts	1 + 1 redundant hot-swappable/850 W
	Input	AC 110 V <sub>AC</sub> to 240 V <sub>AC</sub> at 50-60 Hz DC -48 to -60 V (option)
Cooling	FAN	6 x hot-swappable redundant fans
	Bootloader	U Boot 1.3.4
SW/ Support	Operating system	Linux Kernel 2.6.21
Sw Support	HW Management	IPMI 2.0
	Switch Management	Broadcom FastPath
Physical Characteristics	Dimensions (W x H x D)	430 x 176 x 450 mm (16.93" x 6.93" x 17.72")
FIIYSICAI GIIAIACIEIISIICS	Weight	21 kg (Net)
	Operating Environment	Temperature: 0 to 40° C
Environmont		Humidity: 20% to 90% RH
EIIVII OIIIIIIEIIL	Ctorago Tomporaturoo	Temperature: -20 to 70° C
	Storage temperatures	Humidity: 5% to 95% RH
Compliance	EMC/Safety	CE/FCC/UL/CB (planned)
	NEBS	NEBS 3.0 design compliant

#### Packetarium<sup>™</sup> Card Specifications

#### NCPB-2310 Cavium Octeon Plus

Processor System	Processor	Cavium Octeon CN5650
	Max Speed	800 MHz
	Processor Cores	12
Custom Mamoru	Memory Socket	Four 240 pin DIMM slots
System Memory	Memory tType and Capacity	ECC registered DDR2 800 MHz DIMMs, up to 8 GB per processor
Doot Floop	Flash Type	Redundant NOR Flash up to 256 MB
BOOLFIASI	Max Flash Size	256 MB
	Physical Connection	PCle x 1 + PCle x16 Gold Fingers
Interface		Two PCIe x4
IIIGHAGG	Logical Connection	Two XAUI
		One 100Base-T
Cooling	CPU Heatsink	Passive Aluminum Cooler
SW Support	Bootloader	Cavium SDK 1.7.2 U Boot
	Operating System	Debian Linux Kernel 2.6.21 MIPS
	Operating System	WR PNELE2.0 (option)
Physical Characteristics	Dimensions (W x H)	245.6 x 148.6 mm (9.67" x 5.85")
	Weight	0.53 kg (Net)



Main Ethernet Switch Board

#### **Ordering Information**

Part Number	Description
NCP-7560-X3A4AE	NCP-7560 Chassis + Main Ethernet Switch Board + 4 Packetarium Cards
NCP-7560-X3A8AE	NCP-7560 Chassis + Main Ethernet Switch Board + 8 Packetarium Cards
NCPB-2310-00AE	Packetarium Card (Cavium Octeon CN5650)



#### Dual LSI ACP-3448 Packetarium™ Card

#### Features

- Dual LSI ACP-3448 1.8GHz NPUs
- Each processor supports 2x DDR3-1066MHz DIMMs
- Compatible w/ NCP-7560, NCP-5360, NCP-3120 and all features
  Packetarium™ system
- Two PCIe x4 slots as control plane
- Two XAUI interfaces as data plane
- Two 1000Base-T connectors as management plane
- IPMI1.5 MMC as HW management

#### Introduction

NCPB-2110 Packetarium<sup>™</sup> adopts two LSI ACP-3448 1.8GHz NPUs. Each ACP-3448 includes eight Power Architecture e500mc cores. This platform features SERDES-based I/O's including two Gen2 4-lanes PCI Express, four XAUI (or sixteen SGMII). An embedded MMC (NXP LPC-1756) Micro-Controller serves as I<sup>2</sup>C controller and provides hardware monitor and power manager functions.

#### **Specifications**

	Processor 1 & 2	LSI ACP-3448
Processor System	Max. Speed	1.8 GHz
	Processor Cores	4 Cores
System Memory	Memory Socket	Two 240-pin DDR3-1066MHz DIMMs (for each NPU)
System Memory	Memory Type and Capacity	2GB UDIMM 1066MHz
Poot Elach	Flach Type NAND Flash	2GB per NPU
DUULFIdSII	SPI Flash	4MB per NPU
Management Interface	Management Port	UART port x 1 & USB port x1
		Two PCIe x4 ports
Interface	Logical Connection	Two XAUI interfaces
		Two 1000Base-T connectors
Cooling	CPU Heatsink	Passive Aluminum Cooler
	Bootloader	LSI SDK
SW Support	Operating System	LSI SDK
	Driver	LSI ACP-3448 driver
Dhycical Characteristics	Dimensions (W x H)	245.6 x 148.6 mm (9.67" x 5.85")
Filysical Gharacteristics	Weight	0.5 kg

#### **Ordering Information**

#### Dual Freescale QorlQ P4080 Packetarium™ Card



#### Features

- Dual Freescale QorlQ P4080 1.5 GHz Design
- Each processor supports 2x DDR3-1300 MHz DIMMs
- Compatible w/ NCP-7560, NCP-5360, NCP-3120 and all features Packetarium™ system
- Two PCIe x4 slots as control plane
- Four XAUI interfaces as data plane
- Two 1000Base-T connectors as management plane
- IPMI1.5 MMC as HW management

#### Introduction

NCPB-2210 Packetarium<sup>™</sup> adopts two Freescale QorIQ P4080 1.5GHz NPUs. Each P4080 includes eight Power Architecture e500mc cores. NCPB-2210 can provide SERDES-based I/O's including two Gen2 four-lanes PCI Express, four XAUI (or sixteen SGMII), along with Freescale Power Architecture based applications.

NCPB-2210 is designed with Atmega128L Micro-Controller, which has an in-built I<sup>2</sup>C controller, and provides hardware monitor and power manager functions.

#### **Specifications**

	Processor 1 & 2	Freescale QorIQ P4080
Processor System	Max. Speed	1.5 GHz
	Processor Cores	8 Cores
Custom Momoru	Memory Socket	Each processor supports 2x DDR3-1300 MHz DIMMs
System wemory	Memory Type and Capacity	Up to 16GB-1300 MHz for each P4080
Doot Floop	NAND Flash	Redundant NAND flash up to 8GB
BOOLFIASII	SPI Flash	Redundant SPI boot flash up to 16MB
Management Interface	Management Port	UART port x 2 & USB port x1
		Two PCIe x4 ports
Interface	Logical Connection	Four XAUI interfaces
		Two 1000Base-T connectors
Cooling	CPU Heatsink	Passive Aluminum Cooler
	Bootloader	Freescale SDK 1.0, U Boot
SW/ Support	Operating System	Freescale DPAA SDK 1.0
Sw Support	Operating System	WR Linux 4.0 (Optional)
	Driver	Freescale QorIQ P4080 driver
Physical Characteristics	Dimensions (W x H)	245.6 x 148.6 mm (9.67" x 5.85")
Physical Unaracteristics	Weight	0.5 kg

#### **Ordering Information**

#### Cavium Oeteon CN-6335 Packetarium™ Card



#### Features

- Cavium Octeon II CN6335-AAP-1300MHz
- Two DDR3 DIMMs supports up to 1333MHz
- Supports HFA/DFA for HW DPI engine (optional)
- Compatible w/ NCP-7560, NCP-5360, NCP-3120 and all Packetarium™ system features
- Two PCIe x4 slots as control plane
- One XAUI interface as data plane
- One 1000 Mbps connector as management
- USB 2.0 MAC/PHYs
- IPMI1.5 MMC as HW management

#### Introduction

NCPB-2305 Packetarium<sup>™</sup> adopts one Cavium Octeon II CN6335 1300Mhz NPU. NCPB-2305 can provide SERDES-based I/O's including two Gen2 four-lanes PCI Express, one XAUI (or four SGMII) connection.

#### **Specifications**

	Processor	Cavium Octeon II CN6335-AAP
Processor System	Max. Speed	Core frequency up to 1.3 GHz
	Processor Cores	6 Cores
System Memory	Memory Socket	Support DDR3 UDIMMs from 1066MHz, up to 1333MHz
System Memory	Memory Type and Capacity	Up to 16GB-1333MHz
Poot Elach	Flash Type NAND Flash	Redundant NAND flash up to 128MB
DUULFIASII	NOR Flash	Redundant NOR flash up to 128MB
Management Interface	Management Port	UART console port x 1
Interface	Logical Connection	Two PCIe x4 ports
1111011000		XAUI x1 or SGMII/SERDES(4-lanes) x1
Cooling	CPU Heatsink	Passive Aluminum Cooler
	Bootloader	Cavium SDK 2.0, U Boot
SW/ Support	Operating System	Cavium SDK 2.0
	Operating System	Debian Linux
	Driver	Cavium CN63XX driver
Physical Characteristics	Dimensions (W x H)	195 x 135 mm (7.7" x 5.3")
Physical Gharacteristics	Weight	0.5 kg

#### **Ordering Information**

#### Cavium Octeon Plus 12-Core CN5650 Packetarium™ Card



#### **Features**

- Cavium Octeon Plus 12-core CN5650 800MHz Design
- Supports 4x DDR2 DIMMs
- Compatible w/ NCP-7560, NCP-3120 and all features Packetarium™ system
- One PCIe x4 slot as control plane
- Two XAUI interfaces as data plane
- 100Mbps connector as management plane
- IPMI1.5 MMC as HW management

#### Introduction

NCPB-2310 is based on the Cavium Octeon CN5650 (12 Cores). It supports up to 16 GB of memory on four DIMM sockets. Two Two PCIe x4 slots provide control plane connectivity with the carrier while two XAUI ports connect to the data plane. The board is remotely managed via a local Module Management Controller (MMC) connected to the carrier's IPMB-L (I2C) bus. A console port and a 100 Mbps port provide further management interface options. Operating system support is available for the Cavium SDK, Linux Debian and Wind River PNE LE

#### **Specifications**

Processor System	Processor	Cavium Octeon CN5650
	Max. Speed	800 MHz
	Processor Cores	12 Cores
System Memory	Memory Socket	Four 240 pin DIMM slots
System memory	Memory Type and Capacity	ECC registered DDR2 800 MHz DIMMs, up to 8 GB per processor
Doot Floop	Flash Type	Redundant NOR Flash up to 256MB
DUUL FIdSII	Max Flash Size	256 MB
	Physical Connection	PCle x 1 + PCle x16 Gold Fingers
Interface		Two PCIe x4 slots
IIIteriace	Logical Connection	Two XAUI interfaces
	Ŭ	One 100Base-T connector
Cooling	CPU Heatsink	Passive Aluminum Cooler
	Bootloader	Cavium SDK 1.7.2 U Boot
SW Support	Operating System	Debian Linux Kernel 2.6.21 MIPS
	Operating System	WR PNELE2.0 (option)
Physical Characteristics	Dimensions (W x H)	245.6 x 148.6 mm (9.67" x 5.85")
Physical characteristics	Weight	0.53 kg

#### **Ordering Information**

#### Cavium Octeon II 32-Core CN6880 Packetarium™ Card



#### **Features**

- Cavium OcteonII 32-core CN6880 1.2GHz Design
- Supports 4x DDR3-1333MHz, 72-bits registered DIMMs with ECC
- Compatible w/ NCP-7560 and all features Packetarium™ system
- Two PCIe x4 slots as control plane
- Two XAUI/DXAUI interfaces as data plane
- 100Mbps connector as management plane
- IPMI1.5 MMC as HW management

#### Introduction

NCPB-2320 is based on the Cavium OcteonII CN6880 (32 Cores). It supports up to 32 GB of memory on four DIMM sockets. Two PCIe x4 slots provide control plane connectivity with the carrier while two XAUI interfaces connect to the data plane. The board is remotely managed via a local Module Management Controller (MMC) connected to the carrier's IPMB-L (PC) bus. A console port and a 100 Mbps connector provide further management interface options. Operating system support is available for the Cavium SDK, Linux and Wind River PNE LE.

#### **Specifications**

	Processor		Cavium Octeon II CN6880
Processor System	Max. Speed		1.2 GHz
,	Processor Cores		32 Cores
Custom Momory	Memory Sock	ket	Four 240 pin DIMM slots
System memory	Memory Type	and Capacity	ECC registered DDR3 1333 MHz DIMMs, up to 32GB
Poot Elach	Elach Type	NOR Flash	Redundant NOR flash up to 256MB
DUULFIASII	Flash Type	Max Flash Size	256MB
Management Interface	Management	Port	UART port x 2 & USB port x1
	Physical Connection		PCIe x 1 + PCIe x16 Gold Fingers
Interface	Logical Connection		Two PCIe x4 slots
IIIGHAGG			Two XAUI interfaces
			100 Mbps connector
Cooling	CPU Heatsink	(	Passive Aluminum Cooler
	Bootloader		Cavium SDK 2.1 U-Boot 2001.03
SW Support	Operating Custom		Linux Kernel 2.6.34.9
	Operating Sys		WR PNELE4.2
Dhugiaal Characteristics	Dimensions (	W x H)	245.6 x 156.6 mm (9.67" x 6.17")
Physical Unaracteristics	Weight		0.88 kg

#### **Ordering Information**

Contact our sales for more pricing & ordering information.

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All product specifications are subject to change without notice

#### Netlogic XLR 732 Packetarium™ Card



#### Features

- Netlogic XLR732 processor Max Speed 1.2 GHz
- Supports 2x DDR2-800MHz DIMMs, up to 4GB
- Compatible w/ NCP-7560, NCP-5360, NCP-3120 and all features Packetarium™ system
- PCle x1 + PCle x16 Gold Fingers
- Two XAUI interfaces as data plane
- TSOP56 Redudant Boot Flash
- 245.6 (W) x 148.6 (H) mm (9.67" x 5.85")

#### Introduction

NCPB-2410 Packetarium<sup>™</sup> network processing card supported all Packetarium<sup>™</sup> family is based on the RMI XLR 732 8-core processor. Each processor supports up to 4 GB of memory on two DIMM sockets. Two PCIe x4 slots provide control plane connectivity with the carrier while two XAUI interfaces connect to the data plane. The board is designed with IPMI 2.0 H/W Management, remotely managed via a local Module Management Controller (MMC) connected to the carrier's IPMB-L (I2C) bus. A console port and a 1000 Mbps connector provide further management interface options.

#### **Specifications**

Processor System	Processor	Netlogic XLR732
	Max. Speed	1.2 GHz
	Processor Cores	8 Cores
System Memory	Memory Socket	Two 240-pin DDR2 DIMM slots
System Memory	Memory Type and Capacity	ECC registered DDR2 800 MHz DIMMs, up to 4GB
Poot Elach	Redudant Boot Flash/Type	S29GL01GP11TFIR10 TS0P56
BOOLFIASI	Max Flash Size	1 Gbit
Management Interface	Management Port	PClex1 + PClex 16 Gold Fingers
		Two PCIe x 4 slots
Interface	Logical Connection	Two XAUI interfaces
		One 1000 Mbps connector
Cooling	CPU Heatsink	Passive Aluminum Cooler
SW Support	Bootloader	Netlogic XLR SDK
	Operating System	Linux Kernel 2.6
Physical Characteristics	Dimensions (W x H)	245.6 x 148.6 mm (9.67" x 5.85")
FILYSIGAT GHATAGLEHISLIGS	Weight	0.5 kg

#### **Ordering Information**

# FWA-3210A/B

1U Rackmount Network Application Platform based on Intel<sup>®</sup> Xeon<sup>™</sup> E3 series and 2<sup>nd</sup> generation Core<sup>™</sup> i7/i5/i3 processors



#### **Features**

- Supports Intel<sup>®</sup> Xeon<sup>®</sup> E3-1225/E3-1275 (FWA-3210A only) and 2<sup>nd</sup> generation Core™ i7-2600/i5-2400(FWA-3210B only) and i3-2120 / Pentium<sup>®</sup>-G850 / Celeron<sup>®</sup>-G540 Processors
- Supports four DDR3 Un-buffered 1066/1333 DIMMs, up to 32 GB (FWA-3210A); two DDR3 Un-buffered 1066/1333 DIMMs, up to16 GB (FWA-3210B)
- Six 10/100/1000 Mbps LAN on Board with up to 3 bypass segments
- One 3.5" or One 2.5" SATA HDD / SSD
- Two Advantech Network Mezzanine Cards (NMCs)



#### Introduction

The FWA-3210 1U appliance can be configured with a range of Intel® processors, Ethernet ports, PCIe I/O options and Advantech's Network Mezzanine Cards (NMCs) to create costeffective platforms for specific enterprise networking applications. The appliance is powered by processors utilizing the LGA-1155 socket, including the Intel® Xeon® E3-1225/1275, 2nd generation Intel® Core™ i7-2600/ i5-2400 /i3-2120, the Pentium®-G850 and the Celeron®-G540 Processor. Memory configurations can include 4 x DDR3 1333/1066 DIMMs for up to 32GB in total. In the base configuration, the system comes with a single internal 2.5" SATA HDD bay, 6 Intel® 82574L GbE controllers, and one PCIe x8 expansion slot. System features include an LCM, RJ45 console, and 2 USB ports. IPMI LOM management support is optional. Additional I/O and processor offload capacity is provided by support for two network mezzanine card modules. The FWA-3210 is 1U Network Appliance targeted at CPU-intensive applications such as high-end Unified Threat Management (UTM) and applications with large I/O bandwidth requirements such as quality and service control or content filtering and management.

		FWA-3210A	FWA-3210B	
Processor System	CPU	Intel Xeon E3-1225/ E3-1275/ 2 <sup>nd</sup> gen. Core i3-2120/ Pentium-G850 / Celeron-G540 processors	Intel 2 <sup>nd</sup> gen Core i7-2600/i5-2400/ i3-2120 / Pentium-G850 / Celeron-G540 processors	
	L2 Cache	8 MB / 6 MB / 3 MB / 2 MB	8 MB / 6 MB / 3 MB / 2 MB	
Chipset	РСН	Intel C206 PCH	Intel H61 PCH	
Memory	Technology	Dual channel DDR3 1333/1066 MHz ECC Un-buffered memory	Dual channel DDR3 1333/1066 MHz Non-ECC Un-buffered memory	
	Capacity	Up to 32 GB	Up to 16 GB	
PCI-Express	Expansion Slots	2 x PCI-Express Gen.2 x4 FH/HL Expansion Slots (FW Or 1 x PCI-Express Gen.2 x8 FH/HL Expansion Slots (I	A-3210A Optional) FWA-3210A Default Configuration)	
	LAN on Board	6 x Intel 82574L 10/100/1000 Mbps Ethernet with opti	onal 3 segment bypass	
Ethernet	NMC	2 x NMC modules with PClex8 gen.2 interfaces Maximum 8 GbE ports or 2 x 10GE ports. Please refer to the "Related Products" section for a list of currently available NMCs		
Mage Storage	SATA	1 x 3.5" or 1 x 2.5" SATA HDD / SSD		
IVIASS SIULAYE	Compact Flash	1 x CFast Socket (CompactFlash with native SATA inter	rface)	
	USB	2 x USB2.0 Type A connectors		
Management Ports &	Serial	1 x RS-232 Console port (RJ-45 connector)		
Perinherals	LCD Module	16 x 2 character display, 5 buttons		
i unphulais	IPMI	LOM Module optional		
	TPM	optional		
Power Supply	Watts	275 W redundant AC PSUs (DC on request)	250 W non redundant AC	
	Input	100 V ~ 240 V @ 50 ~ 60 Hz, full range		
Environment		Operating	Non-Operating	
	Temperature	0 ~ 40° C (32 ~ 104° F)	-20 ~ 75° C (-4 ~ 167° F)	
	Humidity	5 ~ 85% @ 40° C (104° F)	5 ~ 95%	
Physical Characteristics	Dimensions (W x H x D)	430 x 44 x 500 mm (16.6" x 1.7" x 19.3")		
T HYSICAL CHALACIENSUUS	Weight	10 kg (22 lb)		

#### FWA-3210A/B



#### **Related Products**



#### **Ordering Information**

Part Number	Description
FWA-3210A-00A1E	1U,C206, 6+2GbE, PSU (1+1), Support 2NMCs
FWA-3210B-00A1E	1U,H61, 6GbE, Single PSU, Support 2NMCs
NAEM-0102E	NAEM-0102 4-port GE module by SFP
NAEM-0103E	NAEM-0103 4-port GE module by RJ45 w/LAN bypass
NAEM-1001E	NAEM-1001 2-port 10GE module by SFP+
NMC-0801E	NMC-0801 8-port GE module by RJ45 w/o LAN bypass

#### Accessories

Part Number	Description
1702002600	3P 180cm, USA
1702002605	3P 180cm, Europe
1702031801	3P 180cm, UK
1700000237	3P 180cm, JP
1700009652	3P 180cm, China

#### **Packing List**



#### 1U Rackmount Intel<sup>®</sup> Atom<sup>™</sup> Processor-based Platform with 6 GbE LAN Ports



#### Features

- Supports Intel® Atom™ D510/D410 Processor
- Single-channel DDR2 667/800 SODIMM, up to 4 GB
- Four GbE LAN ports w/LAN bypass
- Two GbE LAN ports for Management
- One proprietary PCIe expansion connector onboard
- Supports one fixed 3.5" SATA HDD



#### Introduction

Conceived as a powerful but low power consumption rack-mount Internet security platform, the FWA-3305 series was specifically designed for mainstream IDS/IPS, Anti-virus, VPN gateway and Unified Threat Management (UTM) applications. The FWA-3305 adopts the latest Intel® Atom™ processor and Intel® 82801HBM I/O Controller Hub. This supports up to 4 GB of Single-channel DDR2 SDRAM on two DIMMs. The platform reserves space for one 3.5" SATA HDD and one CompactFlash slot for storing or upgrade OS and other network security applications. By leveraging PCI Express (PCIe) technology, the FWA-3305 takes full advantage of the ICH8M PCIe capability to maximize I/O throughput. The platform has five PCIe x1 lanes connected directly to the Intel® 82583V Ethernet controllers and one 82567V Gbe PHY to offer 6 ports of Gigabit Ethernet at wire speed. For easy access, the front panel also has an RJ-45 console port and LCD Module for local system management, maintenance, and diagnostics. It is FCC, CE, UL, CCC and RoHS compliant.

	CPU (45 nm)	Intel Atom D510	Intel Atom D410		
	Max. Speed	1.66 GHz (Dual Core)	1.66 GHz (Single Core)		
Processor System	L2 Cache	1 M	512 KB		
	Chipset	ICH8M			
	BIOS	AMI 16 Mbit SPI			
Memory	Technology	Single-channel DDR2 667/800 SODIMM			
womory	Capacity	Up to 4 GB			
Expansion	PCI Express (PCIe)	1 proprietary internal PCIe x1 connector for LAN e	xpansion board (optional)		
	Mini PCle	Optional			
Ethorpot	Gigabit Ethernet	1 x 82567V GbE,1 x 82583V GbE 4 10/100/1000 Mbps PCIe GbE ports			
EUIGIIIGI	GbE Controller	4 x Intel 82583V			
	LAN Bypass	2 segment on GbE ports			
	SATA	SATA connector x 3 on separate SATA channels Max, data transfer rate 300 MB/s			
Storage		Supports 3.5" SATA HDD x 1			
	CompactFlash Socket	1 CF socket on IDE 0 (Primary/Master)			
	USB	2 (USB 2.0)			
Daripharal	Serial	1 (RJ45)			
renpheral	LCD Module	1			
	K/B, Mouse, LPT, CRT, COM	Pin Headers			
Dowor	Watts	100 W			
Power	Input	90 ~ 240 V <sub>AC</sub> , auto range			
		Operating	Non-Operating		
Environment	Temperature	0 ~ 40° C (32 ~ 104° F)	-20 ~ 75° C (-4 ~ 167° F)		
	Humidity	5 ~ 85 % @ 40° C (104° F)	5 ~ 95 %		
Dhusiaal Characteristics	Dimensions (W x H x D)	426 x 44 x 320 mm (16.7" x 1.7" x 12.6")			
Physical Unaracteristics	Weight	4.5 kg (9.9 lb)			



#### **Ordering Information**

Part Number	Processor	LAN	Bypass	Power Supply
FWA-3305-00A1E	D410	6	1 pair	100 W
FWA-3305-01A1E	D510	6	2 pairs	100 W

#### Accessories

Part Number	Description
1702002600	3P 180 cm, USA
1702002605	3P 180 cm, Europe
1702031801	3P 180 cm, UK
170000237	3P 180 cm, JP



#### **Packing List**

Part Number	Description
170000298	VGA port cable (for system installation use)
1700018155	PS/2 Keyboard/Mouse Cable 20 cm
1700009572	SATA Data Cable 20 cm
1700002463	Console Cable RJ45 220 cm

#### 1U Rack-mount Network Application Platform based on Intel® Xeon® Processor X3400 or Intel® Core™ i5/i3 Processor



#### **Features**

- Supports Intel® Xeon® processor X3400 or Intel® Core™ i5/i3 processor
- Supports four DDR3 ECC/REG 1066/1333 DIMMs, up to 32 GB or four DDR3 ECC Un-buffered 1066/1333 DIMMs, up to 16 GB
- Nine 10/100/1000 Mbps LAN ports
- Supports one 3.5" SATA HDD
- Supports one PCIe Full-height/Half-length add-on card
- Supports one Express LAN module (Option)



#### Introduction

The FWA-4208 is an optimized industry standard 1U platform that supports the new generation Intel<sup>®</sup> Xeon<sup>®</sup> processor X3400 and DDR3-1333 MHz memory up to 32 GB capacity. The FWA-4208 provides unprecedented performance, connectivity and throughput without compromising on system thermal design. By leveraging PCle Gen.2 technology, the platform maximizes I/O throughput by taking full advantage of the Intel<sup>®</sup> Xeon<sup>®</sup> processor X3400 capability. Multiple Gigabit Ethernet controllers provide bi-directional 2 Gb/s peak bandwidth at wire speed for each port and the PCle interface connects to the Intel<sup>®</sup> 3420 PCH directly. The system supports up to 9 x Gigabit Ethernet ports, 1 x PCle x 4 NIC modules, up to 1 x PCle Gen.2 x 8 expansion slot, and a 1 x 3.5 inch internal SATA HDD. It is FCC, CE, UL, CCC, and RoHS compliant.

	CPU	Intel Xeon X3400 processor/ Intel Core i5/i3 processor	
Processor	Max. Speed	2.93 GHz/3.06 GHz	
	L2 Cache	4 MB/8 MB	
Chipset	PCH	Intel 3420 PCH	
	Technology	DDR3 1333/1066 MHz ECC/REG or ECC Un-buffered memory	
Memory	Capacity	Supports up to 32 GB DDR3 ECC Registered memory (	RDIMM)
	Capacity	Supports up to 16 GB DDR3 ECC Un-buffered memory	(UDIMM)
	Expansion Slot	1 x PCIe Gen2 x 8 internal Gold fingers for NIC module	1
PCI-Express	Riser Card	1 x PCIe Gen2 x 8 slot by PCIe Gen2 x 8 Lanes	
		Supports full-height/half-length card and external access	
	Gigabit Port	9 x Intel 82574L 10/100/1000 Mbps Ethernet	
Ethernet	LAN Bypass	Up to 4 segments on Gigabit Ethernet ports	
	Express Module	Supports 1 x 4-port GbE module via RJ-45/SFP interface	
Storage	SATA	1 x 3.5" SATA internal hard disk drive	
Storage	Compact Flash	1 x CF Socket	
	USB	2 x USB 2.0 connectors	
Peripheral	Serial	1 x console port via RJ-45 connector	
	LCD Module	1	
Dowor	Watts	250W	
POWEI	Input	AC 100 ~ 240 V @ 50 ~ 60 Hz, full range	
Environment		Operating	Non-Operating
	Temperature	0 ~ 40° C (32 ~ 104° F)	-20 ~ 75° C (-4 ~ 167° F)
	Humidity	5 ~ 85% @ 40° C (104° F)	5 ~ 95%
Dhugiaal Characteristics	Dimensions (W x H x D)	430 x 44 x 436.5 mm (16.9" x 1.7" x 17.1")	
Physical Unaracteristics	Weight	10 kg	





#### **Ordering Information**



#### Accessories

Part Number	Description
1702002600	3P 180 cm, USA
1702002605	3P 180 cm, Europe
1702031801	3P 180 cm, UK
1700000237	3P 180 cm, JP



#### **Packing List**

Part Number	Description
1700002463	Cable RJ-45 to console 9P 220 cm T

\* Advantech may make changes to specification and product descriptions at any time, without notice.

## Multi-Core™ x86 Intel® Xeon® Processor 5500 series based 2U Network Application Platform



#### **Features**

- Supports dual Intel® Xeon® processors 5500/5600 series with QPI up to 6.4 GTs
- Twelve DDR3 1066/1333 registered ECC memory up to 96 GB
- Four FRU modules by the PCI-express x8 gen.2 connectors
- FRU module includes 4-port RJ-45/SFP GE NIC module, 2-port SFP + 10GE NIC module and 8-port RJ-45/SFP GE NIC module
- Two PCI-E full-height/ half-length add-on cards
- Two 2.5" removable SATA HDD
- Supports remote management IPMI2.0 compliant



#### Introduction

Built upon functionality and capability, the FWA-6500 system provides the high performance and feature set required for dual processor-based high-end network communication appliances with configuration options optimized for intensive computing, high energy-efficiency and high speed I/O bandwidth. The Intel<sup>®</sup> Xeon Dual/Quad-Core<sup>™</sup> processors are based on the Intel<sup>®</sup> QuickPath Interconnect architecture and VT technology improve the performance in a virtual environment. The technology supports DDR3 1066/1333 Registered ECC memory with the memory controller embedded in the processor.

The chipset consists of the Intel® 5520 IO Hub (IOH), Intel® I/O Controller Hub (ICH10R) and the I/O subsystem. The Intel® 5520 IOH provides 36 PCI-E Gen2 lanes and the ICH10R provides 6 x PCI-E Gen1 lanes. Therefore, the FWA-6500 can provide flexible and different combinations of Ethernet modules such as 4-port RJ-45/SFP GE NIC modules, 2-port SFP+ 10GE NIC modules and 8-port RJ-45/SFP GE NIC modules. In the front. In addition, the FWA-6500 can support standard PCI-express expansion slots with a riser card.

The FWA-6500 is optimized for space constrained installations. The FWA-6500 can support two 2.5" SATA hard disk drives and still have space to support 2 PCI-E add-on cards in front for external access. The front panel also has one RJ-45 type serial port, two Gigabit Ethernet management ports, two USB ports and an LCD Module for local system management, maintenance, and diagnostics. The system is FCC, UL, CE, CCC and ROHS compliant.

	СРИ	2 x Intel Xeon Dual/Quad-Core processors	
Processor	Max. Speed	Intel Xeon Processor 5500/5600 series with QPI up to 6.4GT/s	
	L2 Cache	4 MB/8 MB	4 MB/8 MB
Memory	Technology	DDR3 1066/1333 MHz ECC registered memory	
	Capacity	Up to 96 GB with 12 DIMM	
	Chipset	Intel 5520 + Intel ICH10R	
		4 x PCIe x8 slots connect to NMC module	
PCIe	Expansion Slot	2 x PCIe x4 slots for riser card	
1 016		1 x PCIe x4 slot for management board	
	Riser Card	2 x PCIe x4 riser cards	
		Supports full-height/half-length cards and external access	
	Management Port	2 x Intel 82574E 10/100/1000 Mbps Ethernet	
	NMC Module	4 x NMC modules	
<b>F</b> (1)		Copper module includes 4 x Gigabit Ethernet ports with Intel	82576 Ethernet controller by RJ-45 interface with LAN
Ethernet	Gigabit Ethernet	bypass	
		Fiber module includes 4 x Gigabit Ethernet ports with Intel 82	5/6 Ethernet controller by SFP Interface
	10GE Module	Intel 82599ES TUGE controller	
	CATA	2 v 2 5" Het evennehle SATA herd drive in the front	
Storage	SAIA Compact Elaph	2 X 2.5 HOL-SWAPPADIE SATA HAIU UNVE III LITE ITOIL	
Domoto Managament		Litashi H0 DMC	
nemole Management			
Dorinhoral	USD	2 x 0.50 2.0 poils in the norm	
renpheral			
	LOD WOULD	600W/2UL(1,1 redundent_600W/ ceeh)	
Power	Walls		
	IIIpul	AC 100 ~ 240 V @ 50 ~ 60 HZ, 1011 Tallge	Non Operating
Environment	Temperature		
	Temperature	$U \sim 40^{\circ} \text{ G} (32 \sim 104^{\circ} \text{ F})$	-20~75° U (-4~107° F)
	Humulty	2 ~ 80% ₩ 40° U (104° F)	ე ~ ყე %
Physical Characteristics	Dimensions (W X H X D)		
- nyoloar onaraotonotioo	weight	18 Kg (40 ID)	





2 x 2.5" SATA HDDs 2 x Management ports E 4 x PCIe FRU Modules 2 x USB 2.0 Ports RJ-45 Console ports PCIe x 4 slot compliant to Gen1

PCIe x 4 slot compliant to Gen2

#### **Ordering Information**

Part Number	Description
FWA-6500CRE	FWA-6500 Base System + 4 x 4-port GE RJ45 Module, Up to 16ports GE
FWA-6500BE	FWA-6500 Base system
NAEM-0102E	4-port GE SFP Module w/o LAN bypass
NAEM-0103E	4-port GE RJ45 Module w/ LAN bypass
NAEM-1001E	2-port 10GE SFP+ Module

\* Advantech may make changes to specifications and product descriptions at any time, without notice.

#### **Accessories**

Part Number	Description
1702002600	3P 180 cm, USA
1702002605	3P 180 cm, Europe
1702031801	3P 180 cm, UK
1700000237	3P 180 cm, JP

#### **Packing List**

Part Number	Description
1700002463	Cable RJ-45 to Console 9P 220 cm T

#### Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 Series Processorbased 2U Network Application Platform



#### Features

- Supports dual Intel<sup>®</sup> Xeon<sup>®</sup> E5-2600 processors
- DDR3 1333/1600 ECC registered memory, up to 384GB
- PCIe gen3 support
- Four Network Mezzanine Cards (NMC) slots for a wide range of GbE and 10GbE NMCs with or without bypass
- One PCIe x8 full-height/ half-length add-on card
- Four 2.5" removable SAS/SATA HDD and SSDs
- IPMI 2.0-compliant Remote Management

#### Introduction

Based on Intel®s latest Xeon® processor platform, the FWA-6510 system is designed for maximum performance, scalability and functionality in a 2U rack mount footprint. This multi-core processor-based, high-end network communications appliance is optimized for computing power and high speed, high density I/O with best-in-class energy efficiency.

Two E5-2600 series Intel<sup>®</sup> Xeon<sup>®</sup> processors (Socket R) with up to 8 cores provide the latest architectural enhancements as well as unprecedented I/O integration: Two Intel<sup>®</sup> QuickPath Interconnects running at up to 8GT/s each support reduced cross-socket memory I/O latencies and increased throughput. Each socket supports 4 DDR3 channels with speeds up to 1600 MHz for up to 384 GB of ECC memory when using the latest LR DIMM technology. Advanced RAS modes such as mirroring and sparing increase platform reliability. Three I/O

controllers per socket provide a total of 80 PCIe lanes supporting the latest gen 3 technology of up to 8Gbps per lane.

With this improved I/O connectivity, the FWA-6510 can support up to 8 Network Mezzanine Cards (NMCs) for modular, configurable networking I/O and acceleration. PCle gen 3 technology paves the way for supporting 40GbE and quad 10GbE modules in the near future. (Please contact your Advantech representative for an overview of available and planned NMCs).

The Intel® C600 Series PCH (chipset) not only integrates standard platform I/O and peripherals, but also supports an integrated SAS controller for the most reliable, highest speed mass storage. Up to four front-loadable 2.5" SAS/SATA hard disks or solid state drives are supported.

Advanced Lights Out Management based on Aspeed's latest iBMC AST2300 and AMI's MegaRAC IPMI suite improves system manageability and reliability, providing platform thermal management, H/W monitoring and supervision. Remote firmware upgrade capability and hardware-based BIOS redundancy make the FWA-6510 an ideal platform for mission-critical and highly available networks.

Support for standard PCI Express expansion slots with a riser card and TPM (Trusted Platform Management) for enhanced platform security round off the feature set of this platform. The management panel at the front provides one RJ-45 serial port, two Gigabit Ethernet management ports, two USB ports and an LCD module, and LED indicators for power/locate/ alert for local system management, maintenance, and diagnostics. The system is FCC, UL, CB, CE, CCC and RoHS compliant.

Processor System	CPU	2 x Intel Xeon E5-2600 processors with integrated 4 channel memory controller and PCIe Gen3 controllers Two full-width Intel QuickPath Interconnect links, up to 8 GT/s in each direction between sockets
	LLC	20 MB per socket
Memory	Technology	Support for DDR3 1066/1333/1600 memory ECC RDIMM Primary CPU support 2 DIMMs/channel, up to 8 DIMMs Secondary CPU support 1 DIMM/channel, up to 4 DIMMs
	Capacity	Up to 384 GB with 12 slots
	PCH	Intel C604 series chipset
PCle	Expansion Slot	4 x PCIe Gen3 x8 slots connect to NMC modules (2 per CPU socket) 1 x PCIe Gen3 x8 slot for riser card (primary CPU)
	Riser Card	1 x PCIe x8 riser card Supports full-height/half-length cards and external access
Network Connectivity	NMC Modules	4 x NMC modules with PCIex8 gen.3 interfaces Maximum 32 GbE ports or 8 x 10GE ports, Please refer to the "Available NMC module list" section for a list of currently available NMCs
	LAN bypass	Up to 16 segments
Storage	SAS/SATA	4 x 2.5" hot-swappable SAS/SATA hard drive in the front (from PCH)
	Compact Flash	1 x CFast socket
	USB Flash Disk	2 x USB 2.0 on-board pin header for USB flash disk (DOM)
System Management	IPMI	Aspeed AST2300 iBMC + AMI MegaRAC firmware Supports IPMI 2.0 Supports iKVM Shared NIC via NC-SI on management LAN ports



#### **Specifications (Cont.)**

Management Ports & Peripherals	LAN	2 x Intel 82574L 10/100/1000 Base-T Ethernet	
	USB	2 x USB 2.0 ports on the front	
	Serial	1 x RS-232 console port by RJ-45 connector on the front	
	LCD Module	16 x 2 graphical display, 5 buttons	
	VGA	Pin header (for debug only)	
	TPM	TPM1.2 compliant (Infineon SLB9635TT1.2)	
Dowor Supply	Wattage	720 W 2U (1+1 redundant, 720 W each)	
Power Supply	Input	AC 100 ~ 240 V @ 50 ~ 60 Hz, full range, With PMBus support	ort
Environment		Operating	Non-Operating
	Temperature	0 ~ 40° C (32 ~ 104° F)	-20 ~ 80° C (-4 ~ 167° F)
	Humidity	5 ~ 85% @ 40° C (104° F)	5 ~ 95%
Physical Characteristics	Dimensions (W x H x D)	430 x 88 x 558 mm (17" x 3.5" x 22")	
	Weight	18 kg (40 lb)	

#### **Available NMC Module List**

Part Number	Description
NMC-0107-10E	4-port GE copper with LAN bypass
NMC-0108-10E	4-port GE SFP w/o LAN bypass
NMC-0803-10E	8-port Copper GE NMC card w/ bypass
NMC-1004-10E	2-port SFP+ 10GE NMC card

#### **Ordering Information**

Part Number	Description
FWA-6510-00E	FWA-6510 2U system, VAC RPU, 4 NMCs up to 32-port GbE

#### Accessories

Part Number	Description
1702002600	3P 180 cm, USA
1702002605	3P 180 cm, Europe
1702031801	3P 180 cm, UK
170000237	3P 180 cm, JP

#### **Packing List**

Part Number	Description
1700012372	Cable RJ-45 to Console 9P 220 cm T

### Tabletop Intel<sup>®</sup> Atom<sup>™</sup> Processor-based Platform with 6 GbE LAN Ports



- Supports Intel® Atom™ D510/D410 Processor
- Single channel DDR2 667 SODIMM, up to 2 GB
- Two GbE LAN ports for Management
- Supports one fixed 2.5" SATA HDD



#### Introduction

Conceived as a powerful but low power consumption Internet security platform, the FWA-1305 series was specifically designed for mainstream IDS/IPS, Anti-virus, VPN gateway and Unified Threat Management (UTM) applications. The FWA-1305 adopts the latest Intel® Atom™ processor and Intel® 82801HBM I/O Controller Hub. This supports up to 4 GB of Single-channel DDR2 SDRAM on two DIMMs. The platform reserves space for one 2.5" SATA HDD and one CompactFlash slot for storing or upgrade OS and other network security applications. The platform has five PCIe x1 lanes connected directly to the Intel® 82583V Ethernet controllers and one 82567V Gbe PHY to offer 6 ports of Gigabit Ethernet at wire speed. Moreover, the FWA-1305 is designed with the fanless cooling for the low noise environment requirement. It is FCC, CE, UL, CCC and RoHS compliant.

Processor System	CPU (45 nm)	Intel Atom D510	Intel Atom D410
	Max. Speed	1.66 GHz (Dual Core)	1.66 GHz (Single Core)
	L2 Cache	1 M	512 KB
	Chipset	ICH8M	
	BIOS	AMI 16 Mbit SPI	
Memory	Technology	Single-channel DDR2 667 SODIMM	
	Capacity	Up to 2 G	
Ethernet	Gigabit Ethernet	1 x 82567V GbE,1 x 82583V GbE	
	algabit Ethemet	4 10/100/1000 Mbps PCIe GbE ports	
	GbE Controller	4 x Intel 82583V	
	0.1 <b>7</b> 1	SATA connector x 3 on separate SATA channels	
Storage	SATA	Max. data transfer rate 300 MB/s	
		Support 2.5" SAIA HUD X I	
	CompactFlash Socket	I CF SOCKET ON IDE U (Primary/Master)	
	USB	2 (USB 2.0)	
Peripherals	Serial	1 (RJ45)	
	K/B, Mouse, LPT, CRT, COM	Pin Headers	
Power	Watts	60 W	
	Input	100 ~ 240 $V_{AC}$ , auto range	
Environment		Operating	Non-Operating
	Temperature	0 ~ 35° C (32 ~ 95° F)	-20 ~ 75° C (-4 ~ 167° F)
	Humidity	5 ~ 85 % @ 40° C (104° F)	5 ~ 95 %
Physical Characteristics	Dimensions (W x H x D)	280 x 44 x 175 mm (11.02" x 1.73" x 6.89")	
	Weight	1.5 kg (3.5lb)	



#### **Ordering Information**

Part Number	Processor	LAN	Power Supply
FWA-1305-00A1E	D410	6	12V/5A, 60W
FWA-1305-02A1E	D510	6	12V/5A, 60W

#### Accessories

Part Number	Description
1702002600	3P 180 cm, USA
1702002605	3P 180 cm, Europe
1702031801	3P 180 cm, UK
1700000237	3P 180 cm, JP



#### **Packing List**

Part Number	Description
1700018155	PS/2 Keyboard/Mouse Cable 20CM
1700002463	Console cable RJ-45 220CM
1700009572	SATA Data Cable 20CM
1700017929	SATA Power Cable 20CM
# NMC Cards

#### Introduction

The NMC series are designed for easy maintenance & field upgradable from the system front panel. Various network interface options including GE copper, GE fiber, 10GE fiber, with or without Ethernet bypass function. Applicants can take full advantage of modular design to match different application and networking service without replacing the original platform. Each NMC has specific bracket design for Advantech middle and high end platforms with NMC slots.

#### **Advantech NMC Cards**

No.	Product Name	Ethernet Controller	I/O	Interface	Bypass	Compatible with the Following Platforms
1	NAEM-0102E	Intel 82576EB x1	4 GbE LAN	SFP	NA	FWA-6500, FWA-3210
2	NAEM-0102-10E	Intel 82576EB x1	4 GbE LAN	SFP	NA	FWA-6510
3	NMC-0108E	Intel I350-AM4 x1	4 GbE LAN	SFP	NA	FWA-6500, FWA-3210
4	NMC-0108-10E	Intel I350-AM4 x1	4 GbE LAN	SFP	NA	FWA-6510
5	NAEM-0103E	Intel 82576EB x1	4 GbE LAN	RJ-45	2 pair GEN 2 Bypass	FWA-6500, FWA-3210
6	NAEM-0103-10E	Intel 82576EB x1	4 GbE LAN	RJ-45	2 pair GEN 2 Bypass	FWA-6510
7	NMC-0107E	Intel I350-AM4 x1	4 GbE LAN	RJ-45	2 pair GEN 2 Bypass	FWA-6500, FWA-3210
8	NMC-0107-10E	Intel I350-AM4 x1	4 GbE LAN	RJ-45	2 pair GEN 2 Bypass	FWA-6510
9	NMC-0801E	Intel 82580EB x2	8 GbE LAN	RJ-45	NA	FWA-6500, FWA-3210
10	NMC-0801-10E	Intel 82580EB x2	8 GbE LAN	RJ-45	NA	FWA-6510
11	NMC-0803E	Intel I350-AM4 x2	8 GbE LAN	RJ-45	4 pair GEN 2 Bypass	FWA-6500, FWA-3210
12	NMC-0803-10E	Intel I350-AM4 x2	8 GbE LAN	RJ-45	4 pair GEN 2 Bypass	FWA-6510
13	NAEM-1001E	Intel 82599ES x1	2 10G LAN	SFP+	NA	FWA-6500, FWA-3210
14	NAEM-1001-10E	Intel 82599ES x1	2 10G LAN	SFP+	NA	FWA-6510
15	NMC-1004E	Intel 82599ES x1	2 10G LAN	SFP+	NA	FWA-6500, FWA-3210
16	NMC-1004-10E	Intel 82599ES x1	2 10G LAN	SFP+	NA	FWA-6510
17	NMC-4001E	Intel 82599ES x2	4 10G LAN	SFP+	NA	FWA-6500, FWA-3210
18	NMC-4001-10E	Intel 82599ES x2	4 10G LAN	SFP+	NA	FWA-6510



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All product specifications are subject to change without notice

#### Silicom NMC Cards

No.	Product Name	Ethernet Controller	I/0	Interface	Bypass	Compatible with the Following Platforms
1	NMC-0104E	Intel 82580EB x1	4 GbE LAN	RJ-45	2 pair GEN 2 Bypass	FWA-6500, FWA-3210
2	NMC-0104-10E	Intel 82580EB x1	4 GbE LAN	RJ-45	2 pair GEN 2 Bypass	FWA-6510
3	NMC-0105E	Intel 82580EB x1	4 GbE LAN	LC	2 pair GEN 2 Bypass	FWA-6500, FWA-3210
4	NMC-0105-10E	Intel 82580EB x1	4 GbE LAN	LC	2 pair GEN 2 Bypass	FWA-6510
5	NMC-0106E	Intel 82580EB x1	4 GbE LAN	LC	2 pair GEN 2 Bypass	FWA-6500, FWA-3210
6	NMC-0106-10E	Intel 82580EB x1	4 GbE LAN	LC	2 pair GEN 2 Bypass	FWA-6510
7	NMC-0802E	Intel 82580EB x2	4 GbE LAN	RJ-45	4 pair GEN 2 Bypass	FWA-6500, FWA-3210
8	NMC-0802-10E	Intel 82580EB x2	4 GbE LAN	RJ-45	4 pair GEN 2 Bypass	FWA-6510
9	NMC-1002E	Intel 82599ES x1	2 10G LAN	LC	1 pair GEN 2 Bypass	FWA-6500, FWA-3210
10	NMC-1002-10E	Intel 82599ES x1	2 10G LAN	LC	1 pair GEN 2 Bypass	FWA-6510
11	NMC-1003E	Intel 82599ES x1	2 10G LAN	LC	1 pair GEN 2 Bypass	FWA-6500, FWA-3210
12	NMC-1003-10E	Intel 82599ES x1	2 10G LAN	LC	1 pair GEN 2 Bypass	FWA-6510













## Half-length PCI Express Card with 4 TMS320C6678 DSPs

# 

#### **Features**

- Four TI TMS320C6678 DSPs on single half-length PCI Express Card with PCIe Gen 2 x8 interface to the edge connector
- Eight TMS320C66x<sup>™</sup> DSP Core Subsystems (C66x CorePacs) @ 1.0 GHz per DSP
- 1 GB DDR-1333 on board memory per DSP
- Supports XDS560v2 evaluation module via JTAG for CCS connection
- Hardware monitor for temperature detection
- Applications:
  - IPTV/Web TV/mobile TV video transcoder
  - Audio and video transcoding/transrating
- Media gateways and accelerator
- Medical applications
- High Performance Computing

#### Introduction

The DSPC-8681 integrates four Texas Instruments TMS320C6678 multi-core digital signal processors (DSPs), the PLX<sup>®</sup> ExpressLane<sup>™</sup> PEX8624 PCle switch, and the Xilinx XC3S200AN Spartan-3 FPGA to achieve the highest possible performance levels in a half-length PCle form factor. The DSPs provide fixed- and floating-point capabilities and include packet accelerator support for various transport plane protocols and a security accelerator engine which supports a wide range of security and encryption standards including DES.

The DSPC-8681 includes Serial RapidIO and SGMII daisy-chains for connecting all DSP devices. Each DSP device is also connected by two separate PCI Express lanes (PCIe x2) via the PEX8624 enabling up to 10Gbps non-blocking throughput. The card can support 120 channels in an H.264 mobile video application (CIF, 30fps) and 60 channels in a content delivery network using H.264 (SD, 30fps). For HD Broadcast applications, the DSPC-8681 is capable of supporting 4 channels of AVCIntra-50, 10-bit, 4:2.0 at 60fps.

The 32 DSP cores on the DSPC-8681 make it ideal for power efficient solutions based on commercial and industrial servers needing the highest performing video processing technology on fast-to-deploy PCIe add-in cards. It is a perfect fit for applications in many industries such as digital media, communications, video-surveillance, medical imaging, bioinformatics, radar, sonar and instrumentation, high performance computing as well as test and measurement.

#### **Specifications**

	Four TI TMS320C6678
	Eight TMS320C66x cores (@1.0GHz) per DSP
Modia Processing Elements	1024 MB DDR3-1333 on board memory
Media Frocessing Elements	Two Serial RapidIO 2.1 x2 interfaces up to 10Gbps bandwidth
	One PCI Express Gen-2 x2 interface
	Dual 10/100/1000Mbps Ethernet w/ SGMII
Host Interface	PCI Express Gen-2 x8 with PCI Express x8 edge connector
Ethernet	1 x 10/100/1000 Mbps Ethernet port
	Host PC Linux DSP program loader
Software Support	MCSDK for TMS320C6678
	PDK for TMS320C6678
Power	Max. 54 W
Cooling	Aluminum cooler with fan (4800 RPM, 19.41 CFM)
Physical Dimonsions	111.15 x 167.65 mm (4.48" x 6.6")
	0.5 kg
	Operating temperature: 0 to 50° C
Environmont	Humidity: 20% to 90 % RH
	Storage temperature: -20 to 70° C
	Humidity: 5% to 95 % RH

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#### **Ordering Information**

Part NumberDescriptionDSPC-8681E-00A1EHalf-length PCI Express Card with 4 TMS320C6678

## Full-length PCI Express Card with 8 TMS320C6678 DSPs



#### **Features**

- Eight TI TMS320C6678 DSPs on single full-length PCI Express Card with PCIe Gen3 x8 interface to the edge connector
- Eight TMS320C66x<sup>™</sup> DSP Core Subsystems (C66x CorePacs) @ 1.0GHz per DSP
- 1GB/2GB (Optional) DDR3-1333/1600 on board memory per DSP
- Applications:
  - Audio and video transcoding/transrating
  - Media gateways and accelerator
  - High Performance Computing
  - Broadcasting Application
  - Automatic Optical Inspection

#### Introduction

The DSPC-8682 integrates eight Texas Instruments TMS320C6678 multi-core digital signal processors (DSPs) each with 2GB of DDR3 1333/1600MHz 64-bit DDR3 memory, the PLX® ExpressLane™ PEX8748 PCIe Gen 3 switch, a Xilinx XC3S200AN Spartan-3 FPGA and an IDT CPS1616 Serial RapidIO Gen 2 switch to achieve the highest possible performance levels in a full-length PCIe form factor. The PEX8748 and the IDT CPS1616 interconnect x2 lanes between each DSP device. A high speed connection to the host is assured through the PEX8748 switch's PCIe x8 Gen 3 interface for the fastest possible data transfers. A HyperLink chip-to-chip interconnect interface has been implemented enabling the on-chip Navigator to transparently dispatch tasks for execution between DSP pairs.

In addition an SGMII daisy chain between all devices is connected to a Broadcom BCM5482S providing two RJ-45 Giagabit Ethernet connections the I/O panel.

The DSP's provide fixed- and floating-point capabilities enabling the board to perform 2,048 GMACs (Giga Multiply-Accumulation operations per second) using the embedded C66x DSP cores inside the TMS320C6678 devices.

The 64 DSP cores on the DSPC-8682 make it ideal for power efficient solutions based on commercial and industrial servers needing the highest performing video processing technology on fast-to-deploy PCIe add-in cards. This raw computing power makes the DSPC-8682 a perfect fit for advanced and complex video processing such as JPEG2000 for 2K/4K processing, AVC-Intra 50/100 and AVC-Ultra, deep-color pixel manipulation, HEVC/H.265 and motion-compensated temporal filtering. It is also suited for applications in many industries such as media gateways and high performance computing.

#### **Specifications**

	Eight TI TMS320C6678
	Eight TMS320C66x cores (@ 1.0GHz) per DSP
Madia Processing Elements	1024/2048 MB DDR3-1333 on board memory
Wieula Flocessing Elements	One Serial RapidIO 2.1 x2 interface up to 10Gbps plus two x1 interfaces up to 5Gbps bandwidth
	One PCI Expess Gen-2 x2 interface
	Dual 10/100/1000Mbps Ethernet w/ SGMII
Host Interface	PCI Express Gen-3 x8 with PCI Express x8 edge connector
Ethernet	2 x10/100/1000 Mbps Ethernet ports
	Host PC Linux DSP program loader
Software Support	MCSDK for TMS320C6678
	PDK for TMS320C6678
Power	Max. 106W
Cooling	Aluminum cooler with fan (4800 RPM, 19.41 CFM)
Physical Dimonsions	111.15 x 312 mm (4.38" x 12.28")
	0.8 kg
	Operating temperature: 0 to 50° C
Environmont	Humidity: 20% to 90 % RH
LINIOIIIIEIIL	Storage temperature: -20 to 70° C
	Humidity: 5% to 95 % RH





#### **Ordering Information**

**Part Number** DSPC-8682G1-00A1E DSPC-8682G2-00A1E

#### Description

Full-length PCI Express Card with 8 TMS320C6678 & 1GB DDR3 on board memory per DSP Full-length PCI Express Card with 8 TMS320C6678 & 2GB DDR3 on board memory per DSP

## DSPC-8661-PCXE

#### 16-Ch H.264 PCIe Video Capture Card with SDK



#### Features

- Powered by TMS320DM8168 SoC
- 16-channel composite video + audio inputs with H.264 H/W compression
- Up to 480 fps at D1 resolution for video recording and display
- One HDMI-out for up to 1080p video output
- Half-length PCIe board with low-power, fanless design
- Embedded digital signal processor for 3rd party program implementation
- Windows and Linux SDK with sample codes



#### Introduction

The DSPC-8661-PCXE is a low-power, half-size PCIe video capture card supporting 16-channel analog video and audio input. The card supports H.264/MPEG4/MJPEG compression formats up to D1 resolution at real-time frame rate (30/25fps) for all channels simultaneously. The HDMI provides up to 1080p high definition (HD) video output that can be the secondary display from a PC host for multi-channel display requirements. Equipped with a high-performance Digital Signal Processor (DSP), the card can offload a system's host processor by executing 3rd party programs, including vision analytics functions, thereby enhancing the overall capabilities of a video surveillance system.

With an easy-to-use software development kit (SDK), the DSPC-8661-PCXE is an ideal solution for system integrators to implement versatile video surveillance applications that fulfill a broad spectrum of customer requirements.

#### **Specifications**

	Channels	16
	Input Format	Composite for NTSC/DAL
	Resolution	
	Compression	H 264/MDEC4/M IDEC
Video Input	Dual Streaming	
video input	May Frame Pate	
	NidX. Flattle hale	400/400 IPS (INI 30/FAL) at DI CDD & VDD
		Tavit & Cranhia OCD
	Connectore	ICAL & GldµIIIC COD
	Chappele	
Availa lancet	Compression	
Audio input	Sampling Rate	Up to 16-bit, 44KHZ, stereo
	Connectors	DVI X1 (8-ch audio shared with video-input connector)
		Pin neader XI (8-ch audio shared with loop-out connector)
	Spot Monitor	RCA connector x1
Video Output	Loop-out	16-ch pin header on board (connecting to expansion board)
	HDMI out	1, resolution up to 1080P
	Digital Inputs	16 (Pin header for connecting to expansion alarm board)
	Digital Outputs	8 (Pin header for connecting to expansion alarm board)
	RS-485	1 for PTZ control (Pin header for connecting to expansion alarm board)
	Giga Lan Port	RJ-45 x1
Paripharals & Accessories	USB 2.0 Port	A-type Female x1
i enprierais & Accessories	SATA Port	x1 (3.0 Gbps)
	Watchdog Timer	Yes
	Data Bus	PCI Express 2.0, Gen2, x1
	Expansion Boards	1x Alarm DIO board (optional), 1x Audio + Loop-out board (optional), 1x 16-BNC Video-in board (optional)
	Cable	3x Board-to-board Cable (optional), 2x 16-BNC Octopus Cable (optional)
	Power Consumption	< 26W
Dhusiaal Characteristics	Operating Temperature	-10 ~ 60° C / 14 ~ 140° F (fanless)
Physical Characteristics	Storing Temperature	-20 ~ 70° C / -4 ~ 158° F
	Dimensions	140 x 111.15 mm (5.51" x 4.38")
	Supported OS by Driver	Windows XP / XPe / Vista / 7, Linux
0.11	SDK	User's Manual. Programming Guide. VC++ Sample Codes
Sonware	DirectX Required	Version 9 or above
	Video Analytics	Operated by the on-chip digital signal processor (optional)

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#### DSPC-8661-PCXE





#### **Ordering Information**

Part Number DSPC-8661-PCXE **Description** 16-ch PCIe H.264 Video Capture Card with SDK

## DSPC-8662-PCXE

#### 8-Ch 3G-SDI PCIe Video Acquisition Card with SDK



#### **Features**

- Powered by quad TI TMS320DM8168 SoC
- 8-channel SD-SDI / HD-SDI / 3G-SDI video + audio inputs
- Supports H.264 / MPEG4 / MJPEG HW compression
- Up to 60 fps at Full HD (1080p) resolution per channel
- Dual 10/100/1000Mbps LAN ports
- Multi-port Ethernet and PCIe Express switch support
- Embedded with digital signal processor for 3rd party program implementation
- SDK with VC++ sample codes



#### Introduction

DSPC-8662-PCXE is an advanced PCIe video acquisition card with the support of 8-channel Serial Digital Interface (SDI) video and audio inputs. DSPC-8662-PCXE is capable to perform multi-channel of H.264 / MPEG4 / MJPEG compression with up to Full HD 1080p resolution at 60fps in each channel (total 480fps simultaneously). Designed for video broadcasting applications, DSPC-8662-PCXE lets users easily capture, encode and distribute multi-channel live video contents through Ethernet or PCI Express interface with the built-in switch support. For video surveillance applications, DSPC-8662-PCXE can execute some powerful 3rd party programs like vision analytics functions by the on-chip high-performance DSP (Digital Signal Processor) that save the host computing resources. With an easy-to-use software development kit (SDK), DSPC-8662-PCXE is an ideal solution for system integrators to implement versatile video broadcasting and surveillance applications, to fulfill various customers' requirements.

#### **Specifications**

	Channels	8
	Input Format	SD-SDI / HD-SDI / 3G-SDI
	SDI Standards	SMPTE 259M / 292M / 344M / 424M
	Resolution	Up to 1920 x 1080p (Full HD 1080p)
Video Input	Compression	H.264/MPEG4/MJPEG
video input	Dual Streaming	Yes
	Max. Frame Rate	480 fps at Full HD 1080p (up to 60fps per channel)
	Bit Rate Control	CBR / VBR / ABR
	OSD	Text & Graphic OSD
	Connectors	BNC
	Channels	8
Audio Input	Compression	ADPCM / G.711
Audio Input	Sampling Rate	Up to 16-bit, 44KHz, stereo
	Connectors	BNC (shared with video inputs)
	LAN Port	10/100/1000 Mbps LAN port x2; RJ-45 connector
Peripherals & Accessories	Watchdog Timer	Yes
	Data Bus	PCIe Gen-2 x8
	Power Consumption	60W
Physical Characteristics	Operating Temperature	-20 ~ 70° C / -4 ~ 158° F
	Dimensions	270 x 111.15 mm (10.63" x 4.38")
	Supported OS	Windows XP / XPe / Vista / 7
		Linux
		User's Manual
Software	SDK	Programming Guide
		VC++ Sample Codes
	DirectX Required	Version 9 or above
	Video Analytics	Operated by the on-chip digital signal processor (optional)

#### DSPC-8662-PCXE





#### **Ordering Information**

Part Number DSPC-8662-PCXE **Description** 8-ch 3G-SDI PCIe Video Acquisition Card with SDK

## DSPC-8662H-PCXE

4-Ch HDMI PCIe Video Decoder Card with 4-ch 3G-SDI inputs and SDK



#### **Features**

- Powered by quad TI TMS320DM8168 SoC
- 4-channel HDMI video / audio outputs up to 1920 x 1080 60 fps
- Supports H.264 / MPEG4 / MJPEG HW decompression
- 4-channel SDI video + audio inputs up to Full HD 60 fps per channel
- One 10/100/1000 Mbps LAN ports
- Multi-port Ethernet and PCIe Express switch support
- Embedded with digital signal processor for 3rd party program implementation
- SDK with VC++ sample codes



#### Introduction

DSPC-8662H-PCXE is an advanced PCle video decoder and display card with the support of HDMI (High Definition Multimedia Interface) video and audio outputs. DSPC-8662H-PCXE is capable to perform multi-channel of H.264 / MPEG4 / MJPEG decoding with up to Full HD 1080p resolution at 60 fps in each channel (total 240 fps simultaneously). Designed for video broadcasting applications, DSPC-8662H-PCXE also supports 4-channel SDI video / audio inputs, and lets users easily capture, encode and distribute multi-channel live video contents through Ethernet or PCI Express interface with the built-in switch support. For video surveillance applications, DSPC-8662H-PCXE can execute some powerful 3rd party programs like vision analytics functions by the on-chip high-performance DSP (Digital Signal Processor) that save the host computing resources. With an easy-to-use software development kit (SDK), DSPC-8662-PCXE is an ideal solution for system integrators to implement versatile video broadcasting and surveillance applications, to fulfill various customers' requirements.

#### **Specifications**

Channel 4	
Output Format HDTV	
Resolution Up to 1920 x 1080p (Full HD 1080p)	
Video Output Decoding Format H.264 / MPEG4 / MJPEG	
Max. Frame Rate 60 fps at Full HD 1080p per channel	
Connector HDMI	
Channels 4	
Input Format SD-SDI / HD-SDI / 3G-SDI	
SDI Standards SMPTE 259M / 292M / 344M / 424M	
Resolution Up to 1920 x 1080p (Full HD 1080p)	
Video Input Compression H.264/MPEG4/MJPEG	
Dual Streaming Yes	
Max. Frame Rate 240 fps at Full HD 1080p (up to 60 fps per channel)	
Bit Rate Control CBR / VBR / ABR	
OSD Text & Graphic OSD	
Connectors BNC	
Channels 4	
Audio Input Compression ADPCM / G.711	
Sampling Rate Up to 16-bit, 44KHz, stereo	
Connectors BNC (shared with video inputs)	
LAN Port 10/100/1000 Mbps LAN port x1; RJ-45 connector	
Peripherals & Accessories Watchdog Timer Yes	
Data Bus PCIe Gen-2 x8	
Power Consumption 60W	
Physical Characteristics Operating Temperature -20 ~ 70° C / -4 ~ 158° F	
Dimensions 270 x 111.15 mm (10.63" x 4.38")	
Supported OS Windows XP / XPe / Vista / 7	
Software SDK Programming Cuide	
DirectX Required Version 9 or above	
Video Analytics Onerated by the on-chin digital signal processor (ontional)	

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#### DSPC-8662H-PCXE





#### **Ordering Information**

Part Number DSPC-8662H-PCXE Description 4-ch HDMI PCIe Video Decoder Card with 4-ch 3G-SDI inputs and SDK

## DSPC-8601-USBE

#### 1-Ch H.264 USB Video Capture Module with SDK



#### Features

- Powered by TI TMS320DM365 SoC
- 1-channel composite video input with H.264 hardware compression
- Supports PCM/G.711 hardware audio compression
- 30/25 fps (NTSC/PAL) at full D1 resolution for recording
- High-speed USB 2.0 interface
- SDK with VC++ sample codes



#### Introduction

DSPC-8601-USBE is a USB 2.0 high-speed video capture module with 1 analog video input and 1 stereo audio input. DSPC-8601-USBE supports H.264 compression formats up to full D1 resolution at real-time frame rate (30/25fps). With an easy-to-use software development kit (SDK), DSPC-8601-USBE is an ideal solution for system integrators to implement versatile video capturing and encoding applications that fulfill a wide variety of customer requirements.

#### **Specifications**

	Channels	1
	Video Inputs	Composite for NTSC/PAL
	Compression	H.264 / RAW
Video Input	Dual Streams	Yes
video input	Frame Rate	Up to 30 fps @NTSC / 25 fps @PAL (adjustable)
	Bit Rate Control	Supports constant bit rate (CBR) & variable bit rate (VBR)
	OSD	Text OSD
	Connector	BNC, male / 1.0Vp-p, 75ohms
	Channels	1 x stereo line-in
Audio Innut	Sampling Rates	Up to 16-bit, 48 KHz, stereo
Audio Input	Compression	PCM / G.711
	Connector	Phone jack, female
	Host Interface	USB 2.0 High Speed
	Power Input	USB bus power
Physical Characteristics	Operating Temperature	0 ~ 70° C (32 ~ 158° F) (with air flow) 0 ~ 60° C (32 ~ 140° F) (without air flow)
	Dimensions	70 x 38 mm (2.75" x 1.49") (Board size)
	Safety	CE / FCC
	Supported OS by Driver	Windows XP / XPe / Vista / 7
Software	SDK	User Manual, Programming Guide and VC++ Sample Codes
	Direct X Required	Version 9 or above

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#### DSPC-8601-USBE





#### **Ordering Information**

Part NumberDescriptionDSPC-8601-USBE1-ch H.264 USB Video Ca

1-ch H.264 USB Video Capture Module with SDK

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