# Networks & Telecom Computing Platforms

## Expertise for Modular Mission Critical Computing

- Packetarium Network Processor Platforms
- PCIe add in cards
- AdvancedTCA Platforms
- MicroTCA Platforms
- Advanced Mezzanine Cards
- CompactPCI Platforms
- Network Application Platforms

ADVANTECH

*Enabling an Intelligent Planet*

www.advantech.com

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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 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, 1U and 2U 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.

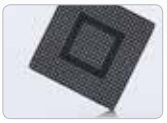
From Research & Development and support facilities in the USA, Europe and Asia, our customer-facing project teams link seamlessly into our worldwide network of over 3100 employees. We manufacture to stringent quality procedures in our own ISO-9001 certified factories in Taiwan and China and our global 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 our 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.

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

Advantech's Ecosystem Initiative was launched on September 1st, 2009. Becoming an Advantech Ecosystem Partner 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.

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

Please email us at NCG@advantech.com or visit www.advantech.com/NC for further details.

# 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 standard IT server. Service providers no longer have to rely on customized 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, which means they can also take advantage of security appliances to handle firewalls, anti-virus, intrusion detection or prevention, and spam etc., to mitigate risk.

## 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 ATCA, CompactPCI and MicroTCA blades offer a modular, open-standards approach. As MicroTCA is expected to bring greater economies of scale over time, it will become a key technology for hardware platform convergence by offering common re-usable Advanced Mezzanine Card technology on a wider scale.

## 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

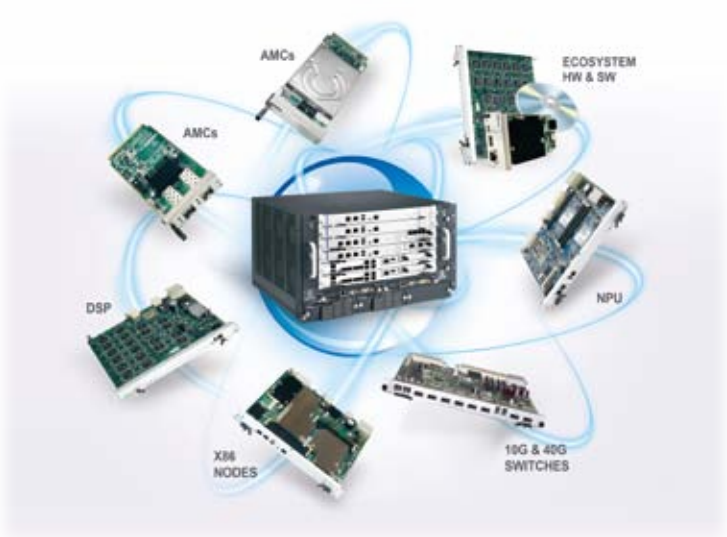
The shift to modular computing and communications platforms is underway. Advantech is firmly committed to helping the telecommunications industry make a smooth transition to modular platforms, by working closely with the strong worldwide community of hardware developers and software solutions providers. 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.

AdvancedTCA® μTCA™ CompactPCI® AdvancedMC™

# AdvancedTCA, 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.

### MicroTCA System Management

Our MicroTCA Carrier Hub (MCH) family combine the control and management infrastructure and the interconnect fabric resources needed to support up to twelve AdvancedMCs. A primary Gigabit Ethernet fabric interconnects up to 12 AMCs. On-board Management Controller functions configure and control the elements and optionally the shelf. Additional modules can be added to the MCH for enhanced switch management, extended fabric options and external clock connectivity.

### Scalability and Processing Density

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

# CompactPCI Platforms



## Complete CompactPCI Computing Platform Solutions

CompactPCI platforms are widely used for mission-critical telecommunication applications that demand high-serviceability, enhanced reliability, and vibration/shock resistance. Advantech CompactPCI solutions are designed with the latest technologies and offer excellent support for rugged design, durability, hot-swapping and CT Buses. All of these great features are available in an easily-expandable "Eurocard" CompactPCI form factor. Advantech CompactPCI platforms incorporate these characteristics into many unique products, including processor boards, chassis, rear I/O units, carrier boards and other accessories – and all are designed to bring flexibility and exceptional value.

### Modularized and Customized Design

Advantech understands the variation among applications; therefore, we are committed to provide a complete line-up of CompactPCI platform solutions to service our customers. Advantech cPCI solutions offer a wide range of 1U to 12U enclosures, as well as both high-performance "professional" and "entry-level" processor boards. Modular design allows customers to mix-and-match solutions based on specific needs, whether it be CT Bus backplanes or additional enclosed redundant power supplies. For ODM and system integrators, Advantech offers custom-made equipment tailored to specific applications through Design To Order Services (DTOS). Leveraging the industry's leading technology, Advantech can speed your development process and significantly reduce capital investments. We offer the best combination of technology and price-for-performance. In addition, Advantech provides basic customization services for SBCs, backplanes, chassis, and system integration.

## CompactPCI Product Lines

### High Density, Configurable CompactPCI Enclosures

CompactPCI systems are available in a full series of 1U to 12U rack-mountable enclosures. They offer different front/rear panel I/Os, redundant power supplies, and cooling mechanisms. The systems comply with many industry standards such as the CompactPCI 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 multi-purpose applications. The high-performance 6U CompactPCI board features the latest Intel® Core2 Duo processor with exceptional I/O expandability for VGA/LAN/SCSI/HDD. These boards are designed to meet rapidly expanding requirements for modern Computer Telephony (CT) and Telecom applications.

### A Variety of CompactPCI Peripherals

Advantech offers a variety of carrier and interface boards for I/O expansions, and PMC modules for added platform features. We provide a complete range of rear transition boards that interface with our CompactPCI CPU boards, plus power supplies and fan modules to complement the system.

# Network Application Platforms

Network Appliances are becoming the mainstream for deploying network security services. Whether it be network security with firewall, virtual private network (VPN) and intrusion detection/prevention; content security with anti-virus and anti-spam; or network access control (NAC) content management systems; the use of network appliances lowers maintenance costs compared to traditional software solutions on standard network servers. As more and more network security functions are delivered via a dedicated appliance, system integrators need to consider the integration between hardware and software, to provide secure and high-performance network throughput. As technology progresses, the use of network appliances have moved on to other network application fields, such as traffic management for WAN optimization and wireless/WiMax gateways.

## The Foundation for Secure Networks

Advantech Network Application Platforms are essentially hardware platforms for network appliances. We are dedicated to the research and development of network security platforms for network security application developers, system integrators and service providers. We provide a full series of standardized x86-based platforms in tabletop, rackmount 1U and 2U form factors. Our high-performance, rack-mountable enterprise platforms feature highly integrated motherboards, LCM control modules and Dual/Quad-core Xeon processor support. Advantech Network Application Platforms are modular to provide the basis for customized solutions. Our tabletop platforms are compact and consume minimal power. User-friendly designs satisfy the need of small businesses or home/office applications.

## Customization, Design and Integration Capabilities

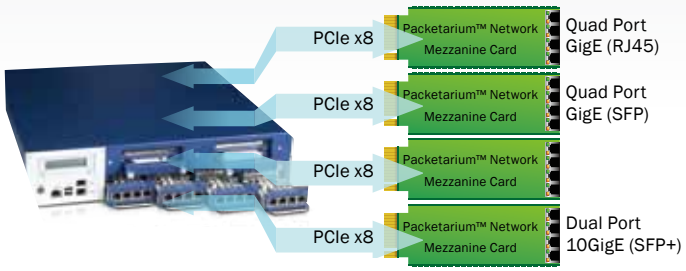
Based on our standard product lines and form factors, Advantech offers tailor-made products and value-added integration services. Various customizations are available from chassis color and front cover design, to extensive board-level design innovations. Apart from the standard x86 platforms, we offer a variety of advanced network security technologies through Design To Order Services. Right from the beginning, Advantech places you ahead of the competition.

While network convergence is evolving and creates the complexity of network connectivity, the use of network processors has become an important source of computing power for dealing with such high speed packet processing. Advantech partners with solution vendors to create the perfect ecosystem to provide the best and innovative solution to the market. Advantech integrates the latest Network Processing Unit (NPU) with security accelerators and Unified Threat Management (UTM) solutions. The result is a platform that can serve more advanced network security applications while taking advantage of enhanced network connectivity. Our professional team of experts understands your computing needs and provides appropriate system integrations and compatibility testing services, so you can focus on the important innovations that are driving a changing networked world.

# Packetarium™ Wire Speed Packet Processing Performance on Modular, Scalable & Customizable Server Platforms

## Network Interface Modules

Provide multi-port GigE and 10 GigE connectivity in AdvancedMC™ (AMC) and Network Mezzanine Card (NMC) profiles. NMC's are similar in form to AMC's, but are cost-optimized for use in Advantech's latest Network Servers and Appliances, including the new FWA-6500 dual Intel® Xeon 5500 platform based on the latest Intel® micro-architecture. The first modules to be released use the best-in-class Intel® Ethernet Controller technology, providing enhanced acceleration features and offload functions. The Network Interface Modules provide PCIe x8 connectivity for maximum packet throughput and optional bypass capabilities:



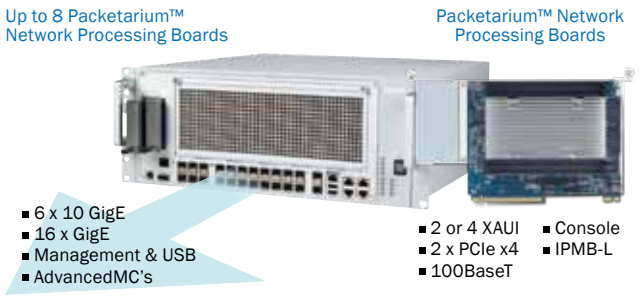

| Form Factor / Profile | Model | On-board Controller | External Ports | Planar |
|---|---|---|---|---|
| Network Mezzanine Card (NMC) | NAEM-0101 | Intel® 82576 | Quad-port GigE (RJ-45) | PCIe x8 |
| Network Mezzanine Card (NMC) | NAEM-0102 | Intel® 82576 | Quad-port GigE (SFP) | PCIe x8 |
| Network Mezzanine Card (NMC) | NAEM-1001 | Intel® 82599 | Dual-port 10 GigE (SFP+) | PCIe x8 |

Advantech's Packetarium™ brand of dedicated networking modules and carriers are available in multiple form factors for both standard and customized platforms and share common design features in order to accelerate system design and maximize hardware and software re-use. The Packetarium™ product line streamlines integration of x86 and multi-core NPU elements along with the latest switching technologies to provide highly flexible system configurability.

The range consists of Packetarium™ Network Processing Modules which connect to a series of Packetarium Mainboards and Carriers for modular system building. These powerful and scalable multi-core building blocks offer the best in 10 GigE and GigE packet processing in homogenous or hybrid topologies.

## Packetarium™ Network Processing Modules

Incorporate onboard Network Processor Units (NPU's) providing enhanced packet processing capabilities in Network Processing Board (NPB) format. NPB's are similar to PCIe slot cards but also provide XAUI connectivity and additional interfaces to a backplane or midplane. To illustrate this, NPB's are plugged into the Advantech NCP-7560 system's main board which provides dual switched XAUI interconnects to up to eight NPB's. This enables very high density multi-core network processing with up to 96 cores using Cavium Octeon™ Plus NPU's. The architecture allows for future NPB technology upgrades where other NPU architectures can be seamlessly supported. The mainboard provides the ingress/egress ports to the outside world with multi-port connectivity.




| NPB Model | On board Processor | Planar connections |
|---|---|---|
| NCPB-2210 | Netlogic XLR732C | XAUI x 2, 2 PCIe x4, 100BaseT |
| NCPB-2310 | Cavium Octeon™ Plus | XAUI x 2, 2 PCIe x4, 100BaseT |
| NCPB-2320 | Cavium Octeon™ II CN6880 | XAUI x 4, 2 PCIe x4, 100BaseT |
| NCPB-2410 | Dual Freescale P4080 | XAUI x 4, 2 PCIe x4, 100BaseT |

## Packetarium™ Systems

The initial system level products include the following models:

| | | Supported Packetarium™ Modules |
|---|---|---|
| NCP-3120 | 1U Single Packetarium™ Board based appliance | NCPB-2310, NCPB-2320. NCPB-2410, NCPB-2210 |
| NCP-5260 | 3U Dual Intel®(R) XEON(R) Appliance with 2 x Packetarium™ board slots | NCPB-2210 |
| NCP-7560 | 4U Server for up to 8 Packetarium NPB's. 6 x 10GbE SFP+, 16 x GbE SFP's on front panel. See datasheet for full front panel details. | NCPB-2310, NCPB-2320. NCPB-2410, NCPB-2210 |

# 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

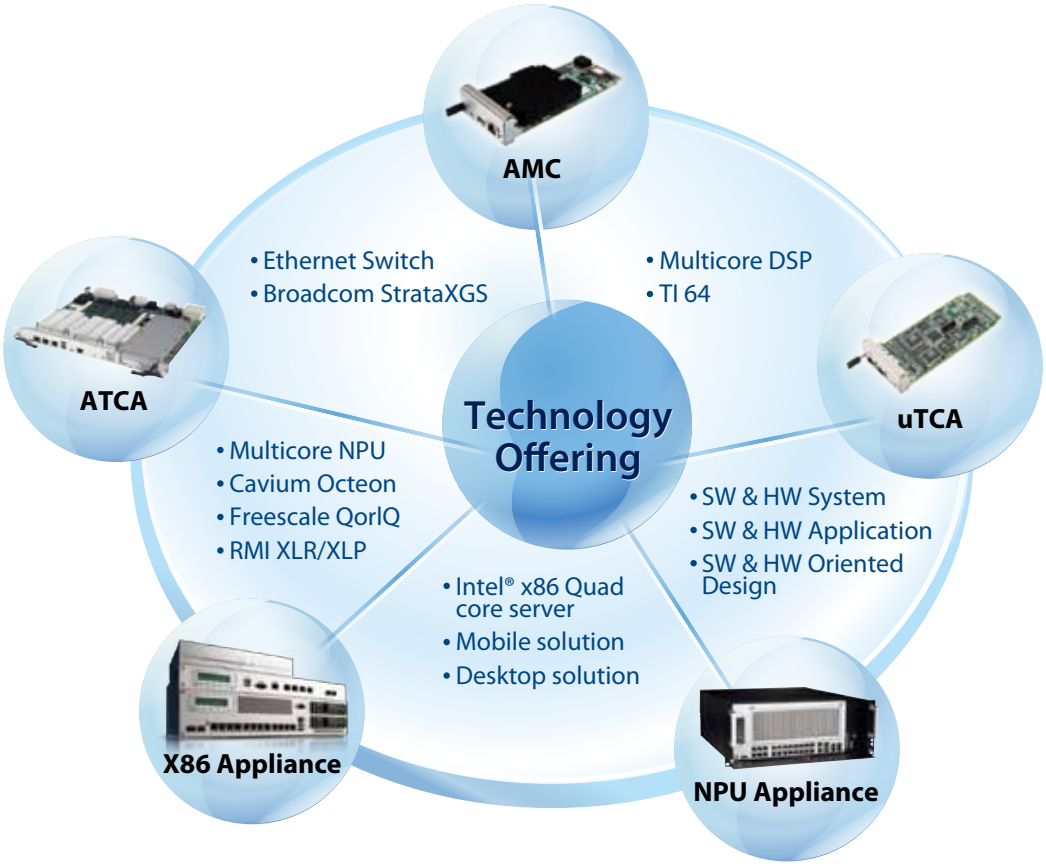
- Global logistic services & RMA
- Flexible logistic packages
- Tailored & TCO optimized

# 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 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 just-in-time response


| | **ATMC**<br>Taiwan Manufacturing Center | **AKMC**<br>China Kunshan Manufacturing Center |
|---|---|---|
| Land | 15,744 $m^2$ | 81,000 $m^2$ |
| Capability | • Small-Volume Production<br>• Board & System Products<br>• ODM/OEM Projects<br>• Engineering Sample Innovation Service<br>• Specializes in Complicated Product Lines | • Mid-to High-Volume Production<br>• Board & System Products<br>• ODM/OEM Projects<br>• Focus on Mature Product Lines |

## 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 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 faster delivery time.

## Quality Assurance Service - Closed Quality Assurance Loop System

Advantech insists on implementing the most up-to-date standards to ensure the quality. We have institutionalized both the ISO 9001 and ISO 14001, the standard 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 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 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 months, 6 months, and 1 to 3 years 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.

# 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.

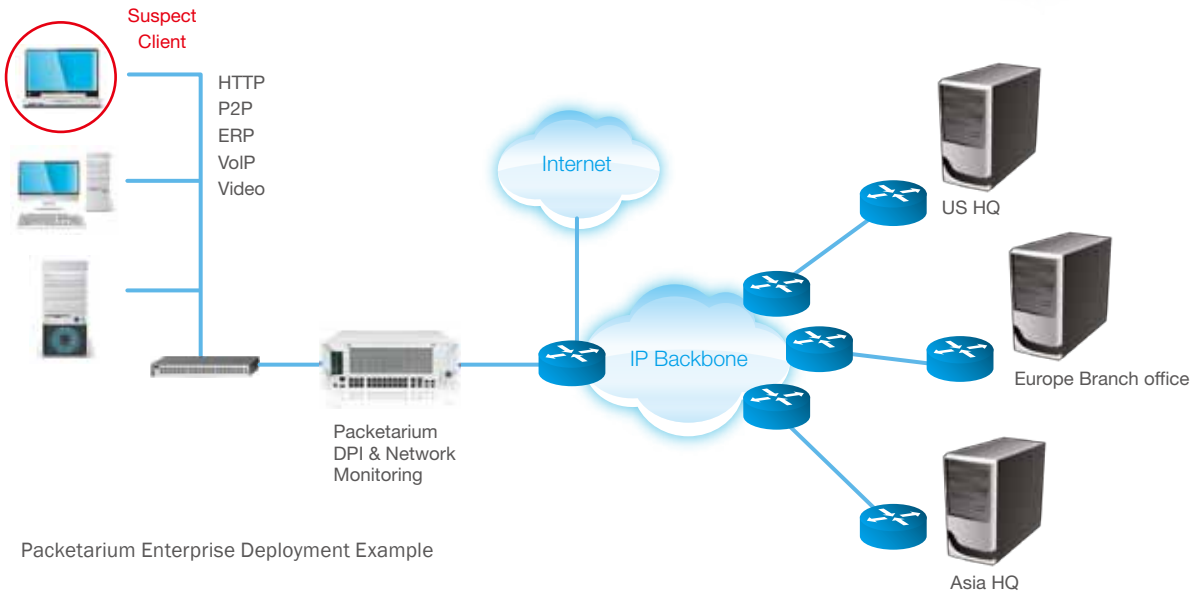
Performance is undoubtedly one crucial element of any DPI solution but so is cost, as early solutions were often very expensive. Advantech's NCP-7560 based Packetarium™ product line addresses both aspects and can deliver wire-speed packet processing, providing up to 80 Gbps throughput. All this at approximately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

## Scalable to 128 Network Processor Cores, with Multiple 10 GbE and GbE Ports

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 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™ Network Processing Boards
  - Cavium Octeon™ Plus
  - Netlogic XLR
  - Freescale QorIQ™
- 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™ support
- Designed for NEBS




Packetarium Enterprise 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."*

# 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™ network processing boards for the data plane. It integrates up to two powerful, multi-core Packetarium™ 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™ 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™ family are also compatible with NCP-5260.

- Packetarium™ 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™ Board slots
- Dual Intel® Xeon® 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

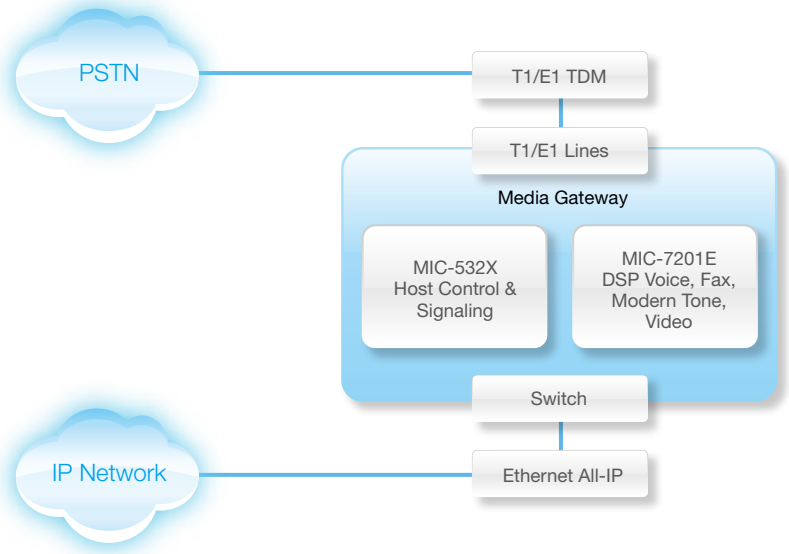
Today when we say “network” it is synonymous with IP or the packet network that we now take for granted has usurped the long-established circuit switched telephone network. Those circuits, however, still exist and the network element that enabled such a change still has an ever evolving and crucial role 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 cards such as Advantech’s DSP AdvancedTCA® Blade. In combination with a processing blade powered by the dual Intel® Xeon® MIC-5322, Advantech has all the ingredients for a modern multifunction media gateway.



*STOP PRESS:*
*For details on the DSPA-8901E ATCA blade with twenty onboard TMS320TCI6608 DSPs to be announced at on Feb 15th 2011 please contact DSP@advantech.com.tw*



# Advantech ATCA Blades for Media Gateway Designs

## PERFORMANCE DENSITY DSP ATCA BLADE

The DSP ATCA Blade is a voice- and video-over-IP DSP farm on a single-slot ATCA blade targeting telephony infrastructure applications, including voice-over-packet high-density gateways, wireless media gateways, and remote access servers. Each of the twenty-two on-board DSPs incorporates 6 cores with 768 KB of shared RAM and 608 KB local L2 RAM and connects to 256 MB external DDR2 memory, thereby reducing system power dissipation and system cost, and enhancing board density. Serial RapidIO is implemented for inter-DSP communications and Gigabit Ethernet is embedded for native connectivity to IP-based systems. The blade includes a high-performance Freescale QorIQ P2020 processor managing a powerful Broadcom BCM56334 switch, which terminates the 10 gigabit Ethernet fabric connections and distributes traffic to the twenty-two DSPs. The DSP ATCA Blade offers unrivaled packet and media processing capabilities for high density transcoding in a compact ATCA form factor.

- 22 Texas Instruments TMS320TCI6486 DSPs
- 1 Broadcom BCM56334 10 GbE switch for both fabric interface and base interface
- 1 Freescale QorIQ P2020 local management processor
- 2 Tundra/IDT Tsi577 Serial RapidIO Switches
- TI Telogy Networks Framework
- ENEA OSEck®, LINX® and dSPEED®
- Wind River Linux PNE-LE 3.0 support for P2020

## MIC-5322 INTEL® XEON® 5600 SPB

The MIC-5322 is a dual processor Intel® Xeon® 5500/5600-based ATCA blade. It enables the highest performance available in an 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® Xeon® 5500 or 5600 processors
- Intel® 5520 IOH36D/ICH10R server class chipset
- 6 DDR3 VLP DIMMs up to 48 GB with ECC support
- Two XAUI ports on Fabric interface
- Two 1000 Mbps ports on Base interface
- Two 1000 Mbps front panel ports
- Two USB2.0 front panel ports
- Fully managed, hot swappable RTM

*"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."*

# IMS-MGW and IMS-MGCF

## Introduction

Even as 3GPP worked toward the definition of what would lead us toward the “All-IP Network” it was clearly recognized that significant transitional and evolutionary steps would be required. 3GPP’s creation, IMS (IP Multimedia Subsystem), is a reference architecture that defines an application services framework with specific elements for session and connection control. Although structured around IP, it encompasses the convergence of voice and data and allows for the integration of legacy TDM circuits. The IMS-MGW (Media Gateway) and MGCF (Media Gateway Control Function) elements enable the bridging of two disparate technologies – circuit based TDM and packet based VoIP. Growth and evolution in these areas continues to accelerate as the broader Media Gateway market and IMS combined represent more than $10 billion over the next 3-5 years.

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.

IMS-MGW - Terminates calls from the switched circuit network and media streams from a packet network. It connects and combines endpoints as necessary and under the control of the MGCF. Media conversion and transcoding, bearer control, and often payload processing are all undertaken by the IMS-MGW. A broadly supported set of CODECs are required along with high quality echo cancellation functionality. The ability to create a conference bridge represents another role for an IMS-MGW.

MGCF - Controls the parts of the call state that pertain to connection control for media channels in an IMS-MGW and maintains communications with the CSCF ensuring that all relevant session information stays in sync. The coordination of signaling between the circuit and pack networks are essential and the responsibility of the MGCF as it communicate between the SIP and ISUP environments.

Creating platforms to support the necessary IMS-MGW and MGCF elements requires performance, flexibility and extensibility in the underlying hardware/software infrastructure. DSP farms are required for media conversion and transcoding while the latest high performance computing processors take care of all the control and signaling functions. The need to combine these functions within a highly available and “network ready” chassis makes AdvancedTCA the ideal architecture. AdvancedTCA enables the appropriate connectivity as well as the infrastructure to support high density DSP cards such as Advantech’s DSP ATCA Blade. In combination with a processing blade powered by the dual Intel® Xeon® MIC-5322, Advantech has all the ingredients necessary to support numerous IMS elements including all the Media Gateway functionality.

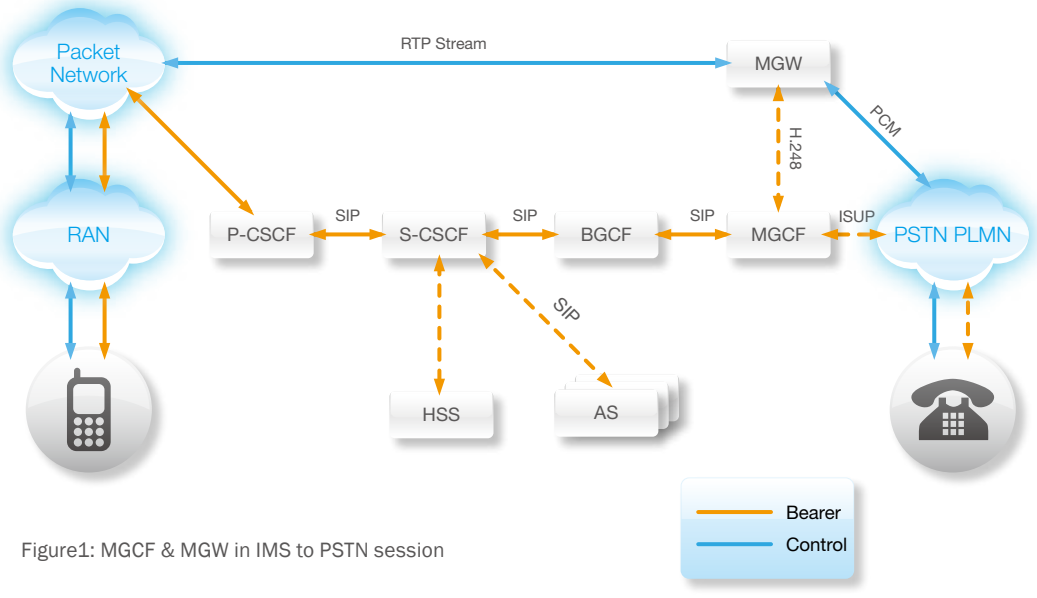



Figure1: MGCF & MGW in IMS to PSTN session

*STOP PRESS:*
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# ATCA for IMS Media Gateway and Controller Designs

## MIC-5322 DUAL INTEL® XEON® 5600 SPB

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

## ADVANTECH ATCA DSP BLADE

The DSP ATCA Blade is a voice and video-over-IP DSP farm on a single-slot ATCA blade targeting telephony infrastructure applications, including voice-over-packet high-density gateways, wireless media gateways, and remote access servers. Each of the twenty-two on-board DSPs incorporates 6 cores with 768 KB of shared RAM and 608 KB local L2 RAM and connects to 256 MB external DDR2 memory, thereby reducing system power dissipation and system cost and enhancing board density. Serial RapidIO is implemented for inter-DSP communications and Gigabit Ethernet is embedded for native connectivity to IP-based systems. The blade includes a high-performance Freescale QorIQ P2020 processor managing a powerful Broadcom BCM56334 switch which terminates the 10 gigabit Ethernet fabric connections and distributes traffic to the twenty-two DSPs. The DSP ATCA Blade offers unrivaled packet and media processing capabilities for high density transcoding in a compact ATCA form factor.

- 22 Texas Instruments TMS320TCI6486 DSPs
- 1 Broadcom BCM56334 10 GbE switch for both fabric interface and base interface
- 1 Freescale QorIQ P2020 local management processor
- 2 Tundra/IDT Tsi577 Serial RapidIO Switches
- TI Telogy Networks Framework
- ENEA OSEck®, LINX® and dSPEED®
- Wind River Linux PNE-LE 3.0 support for P2020

*"AdvancedTCA offers the right combination of flexibility, extensibility and performance options. The MIC-5322 and DSP ATCA Blade individually or in combination enable the creation of a variety of configurable IMS platforms including an IMS-MGW or MGCF."*

# 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 smartphone 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 48GB of triple channel DDR3, Advantech's Intel® Xeon® 5600-based ATCA blades are the perfect choice for your SIP Application Server.

# 6 and 12-Core Intel® Xeon 5600 Series ATCA Blades for SIP Application Server Design

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

## MIC-5320 BLADE SINGLE INTEL® XEON® 5600 SERIES PROCESSOR BLADE

Advantech's MIC-5320 single-slot AdvancedTCA® processor blade combines computing performance with I/O flexibility in a power-efficient design. Supporting Intel's® latest Xeon® processors using the latest microarchitecture and 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® Xeon® 5500 and 5600 Series allows tremendous upgradeability, scalability and cost efficiency options with two-, four- or six-core processors fully supported.

- One 2-, 4- or 6-Core Intel® Xeon® 5500 or 5600 processor
- Intel® 5520 IOH36D / ICH10R server class chipset
- 6 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/CLK support
- Onboard serial attached SCSI (SAS) controller with failover support
- 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 48GB of triple channel DDR3, Advantech's Intel® Xeon® 5600-based ATCA blades are the perfect choice for your SIP Application Server."*

# Video Transcoding

## 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. The Advantech DSP Blade, a high-density, AdvancedTCA-based DSP solution provides the ideal architecture to support multi-format transcoding applications.

*STOP PRESS:*
*For details on the DSPA-8901E ATCA blade with twenty onboard TMS320TCI6608 DSPs to be announced at on Feb 15th 2011 please contact DSP@advantech.com.tw*



## Advantech DSP ATCA Blade for Voice and Video Applications

The DSP ATCA Blade is a voice and video-over-IP DSP farm on a single-slot ATCA blade targeting telephony infrastructure applications, including voice-over-packet high-density gateways, wireless media gateways, and remote access servers. A key requirement of telephony infrastructure applications is the availability of large on-chip memories to handle vast amounts of channel data during transcoding processing.

Each of the twenty-two on-board DSPs incorporate 768 KB of shared RAM and 608 KB local L2 RAM and connect to 256 MB external DDR2 memory, thereby reducing system power dissipation and system cost, and enhancing board density. Each DSP has six optimized cores, making a total of 132 cores per DSP ATCA Blade; this combines highest performance with the lowest power dissipation per port. Serial RapidIO is implemented for inter-DSP communications and Gigabit Ethernet is embedded for native connectivity to IP-based systems. The blade is an excellent choice for applications including video and telecom infrastructure, medical imaging, and wireless infrastructure. The C64x+ devices are upward code-compatible from previous C6000™ devices making the DSP ATCA Blade an ideal upgrade platform from previous generation designs.

The DSP ATCA Blade includes a high-performance Freescale QorIQ P2020 processor managing a powerful Broadcom BCM56334 switch, which terminates the 10 gigabit Ethernet fabric connections and distributes traffic to the twenty-two DSPs. The DSP ATCA Bladeoffers unrivaled packet and media processing capabilities for high-density transcoding in a compact ATCA form factor, all with a power consumption of under 220W. DSP software support is available through TI's Telogy Networks framework and codecs, and from Advantech's ecosystem software partner, ENEA.

- 22 Texas Instruments TMS320TCI6486 DSPs
- 1 Broadcom BCM56334 10 GbE switch for both fabric interface and base interface
- 1 Freescale QorIQ P2020 local management processor
- 2 Tundra/IDT Tsi577 Serial RapidI/O Switches
- TI Telogy Networks Framework
- ENEA OSEck®, LINX® and dSPEED®
- Wind River Linux PNE-LE 3.0 support for P2020
- Single-slot PICMG 3.0/3.1 compliant

# 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-4208 is an excellent example of an OEM application ready platform. Available with up to 9 Gigabit Ethernet ports and considerable expansion options along with a choice of the latest Intel® embedded and commercial processors the FWA-4208 is ideally geared towards the needs of the SBC OEM. The FWA-6500 based on dual Intel® Xeon 5600 processors with up to 12 cores positions it well for more demanding performance and 10GbE connectivity.

# Advantech OEM-Ready Appliances with Intel® Xeon® processors for Session Border Control

## FWA-4208

Advantech's FWA-4208 OEM-Ready Appliance is based on the Intel® Xeon® 3400 series Quad Core processor and Intel® 3420 PCH chipset. The 1U rackmount FWA-4208 is ideal for Session Border Controllers and other Network Security applications that seek to improve the entry-level cost point of high-performance systems. The FWA-4208 provides the hardware platform for multi-gigabit filtering and intrusion prevention performance across nine GbE ports. The system scales to meet additional port expansion requirements or add-on hardware acceleration needs.

Based on Intel® microarchitecture, the new Intel® Xeon® processor 3400 series is designed with innovative features that can adapt performance to software and business needs, help energy consumption for optimum performance and efficiency, and enable hardware-based virtualization capabilities. The capabilities designed into the FWA-4208 makes it ideal for OEM's dealing with medium-sized businesses who are stepping up to their first multi-gigabit Unified Threat Management (UTM) platform or are replacing a previous generation device.

- Intel® Xeon® X3400 or Intel® Core i5/i3 Processor
- Supports 4 x DDR3 ECC DIMMs up to 32 GB
- 9 x 10/100/1000 Mbps LAN ports
- 1 x 3.5" SATA HDD
- 2 x PCIe Full-height/Half-length slots
- 1 x Express LAN module (Option)

## FWA-6500

The FWA-6500 is based on a similar core design as Advantech's MIC-5322 ATCA Blade. It comes with up to two 6-core Intel® Xeon® Processor 5600's in an enterprise server form factor aimed at high performance networking applications including session border controllers. Network connectivity is fast and flexible with up to 16 front accessible GbE ports supported by Intel® 82576 modules or with dual 10 GbE modules based on the Intel® 82599. The modules plug in to PCIe x8 Gen2 interfaces to the IO controller hub which makes the system fly. RJ45 and SFP based modules are supported and can be mixed as required. Two PCIe x4 slots are available internally for standard add-in cards.

The combination of high end processors, chipsets and Ethernet controllers in one platform providing acceleration and off-load features gives customers high throughput and I/O scalability. The system incorporates up to 96GB of DDR3 memory making it perfect for fast, persistent, in-memory databases where performance is key.

For improved availability, two swappable SATA hard drives and a redundant power supply are integrated. An internal remote management board provides Serial and USB connectivity as well as two LAN ports for remote & out of band management. IPMI 2.0 is supported along with remote monitoring, power cycling and SOL to console.

- Two 2/4/6-Core Intel® Xeon® processors, 5500 or 5600 series
- 12 x DDR3 Registered ECC Memory up to 96 GB
- 4 x FRU modules on PCIe x8 gen.2 connectors
- FRU modules: 4 GbE ports RJ45 or SFP, 2 10GbE ports SFP +, 8 GbE ports RJ45 or SFP
- 2 x PCIe full-height/ half-length add-on cards
- 2 x 2.5" removable SATA HDD (3.5" removable SATA HDD option)
- IPMI 2.0 compliant Remote Management

# 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® Core2 Duo processors, Advantech designed a cost-optimized ODM platform suitable for high capacity, cost-sensitive base station applications. The system was selected by Cambridge, Massachusetts-based 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® 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® Core2Duo 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® CORE 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-in-class 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.

Activ Networks
Ultimate Web Accelerators

BoostEdge
the magic box

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 multi-core network processor boards with over 100 cores handling core network traffic on multiple 10 gigabit and gigabit Ethernet ports.

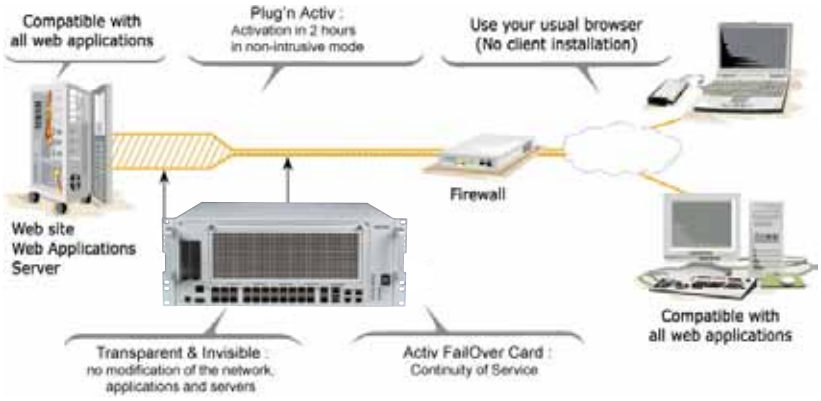
## 80 Gbps Throughput Scalable to 128 network processor cores Multiple 10 GbE and GbE ports

The NCP-7560 represents the high performance end of Advantech's Packetarium™ product line. It integrates up to eight powerful, multi-core Packetarium™ 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™ Network Processing Boards
- Cavium Octeon™ Plus
- Netlogic XLR®
- Freescale QorIQ™
- 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™ 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.

# 6- and 12-Core Intel® Xeon® 5600 Series ATCA Blades for Mobility Management Entity (MME) Integration

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

## MIC-5320 BLADE SINGLE INTEL® XEON® 5600 SERIES PROCESSOR BLADE

Advantech's MIC-5320 single-slot AdvancedTCA processor blade combines computing performance with I/O flexibility in a power efficient design. Supporting Intel's latest Xeon® processors using new 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® Xeon® 5500 and 5600 Series allows tremendous upgradeability, scalability and cost efficiency options with two-, four- or six-core processors fully supported.

- One 2-, 4- or 6-Core Intel® Xeon® 5500 or 5600 processor
- Intel® 5520 IOH36D / ICH10R server class chipset
- 6 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/CLK support
- Onboard serial attached SCSI (SAS) controller with failover support
- 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 48GB of triple channel DDR3, Advantech's Intel® Xeon® 5600-based ATCA blades are the perfect choice for core network element design."*

# 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 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 Octeon II-based products.

## NCP-7560

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 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™ Network Processing Boards
- Cavium Octeon™ Plus
- Netlogic XLR
- Freescale QorIQ™
- 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™ 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 Intel® Atom™ based FWA-3305 along with the FWA-4208 and 2U FWA-6500 supporting a variety of Intel® Xeon® processing options. At the higher end, Advantech's MIC-532X AdvancedTCA blades supporting 2-, 4- or 6-core processors round out a variety of flexible options that deliver right at the sweet spot needed to match requirements for any Unified Threat Management platform.

# Advantech OEM-ready Network Appliances and AdvancedTCA Blades for Unified Threat Management

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

The MIC-5320 and MIC-5322 are single- and dual-processor Intel® Xeon® 5500/5600-based ATCA blades. They enable the highest performance available in an ATCA form factor, with up to 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.

## FWA-6500 INTEL® XEON® PROCESSOR 5500/5600 SERIES 2U 10 GBE NETWORK SERVER

The core system design is the same as the MIC-5322, providing the highest performance possible with flexible and scalable port densities. This facilitates portability of software applications between the FWA-6500 and the ATCA-bladed environment above. The key elements to optimized network connectivity are the Intel® 5520 IOH, which provides 36 PCIe Gen2 lanes, and the ICH10R with 6 x PCIe Gen1 lanes. The FWA-6500 offers a combination of front loading Ethernet modules including: 4-port RJ-45/SFP GE NIC modules, 2-port SFP+ 10GE NIC modules and 8-port RJ-45/SFP GE NIC modules. In addition, the FWA-6500 supports standard PCI-express expansion slots with a riser card. The system is space-optimized for two 2.5" SATA drives as well as 2 PCIe add-on cards with front panel 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.

## FWA-4208 1U RACK-MOUNT NETWORK APPLICATION PLATFORM BASED ON INTEL® XEON® X3400 OR CORE i5/i3 PROCESSORS

The FWA-4208 is an optimized industry standard 1U platform that supports the new generation Intel® Xeon® 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 PCIe Gen 2 technology, the platform maximizes I/O throughput by taking full advantage of the Intel® Xeon® X3400 processor. Multiple Gigabit Ethernet controllers provide bi-directional 2 Gb/s peak bandwidth at wire-speed for each port, and the PCIe interface connects to the Intel® 3420 PCH directly. The system supports up to 9 x Gigabit Ethernet ports, 1 x PCIe x 4 NIC modules, up to 2 x PCIe Gen2 x 8 expansion slots, and 1 x 3.5 inch internal SATA HDD.

# IPTV

## 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 Network Processor Platforms for IPTV 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 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 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 multi-core 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

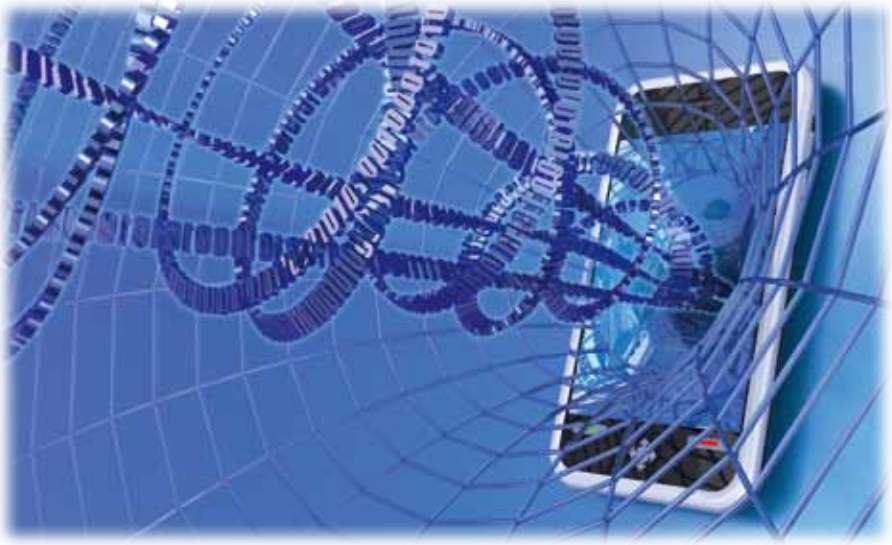
## Introduction

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.



# Advanced Mezzanine Card with Freescale QorIQ P4080 10GbE, XAUI, SRIO, PCI Express & SGMII ports for Radio Access Network (RAN) Design

### AMC-4201 –EXPANDING ADVANTECH'S AMC PORTFOLIO WITH QorIQ

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.

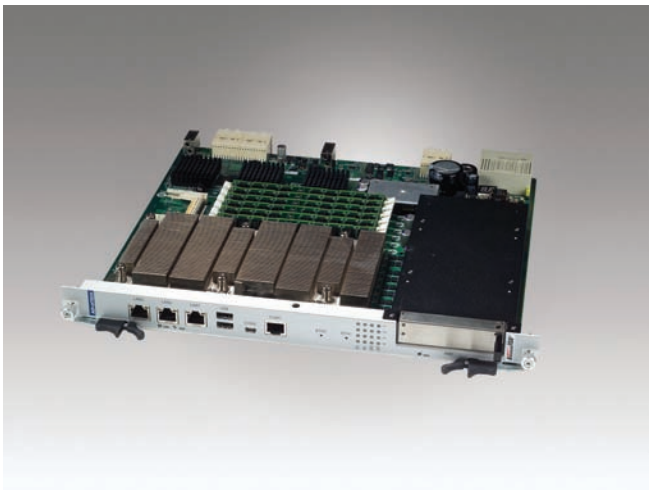
The unique SERDES design supports up to four different AMC port configurations for a mix of SRIO, PCIe, XAUI and SGMII channels. This makes the AMC extremely versatile and caters to a wider range of MicroTCA or ATCA Carrier topologies beyond just telecom applications. 16 MBit SPI Flash and 2 GB NAND Flash provide onboard options for software and storage. The AMC also provides 8 KHz and 19.44 MHz telecom clock synchronization support.

- 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
- 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

*"The combination of multi-core packet processing with enhanced encryption and security, functions at a comparably low power consumption, makes Freescale's P4080 a compelling processor for AMC form factor designs," said Byron Lin, Director at Advantech's Networks and Telecom Group. "There is a lot of AMC and MicroTCA activity right now in the Radio Access Network (RAN) segment, and the AMC-4201 stacks up well with the needs of the key players. In addition, this is the industry's first 8-core Power Architecture-based AMC and we are seeing huge interest in its use as a general purpose multi-core CPU."*

# MIC-5320

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



## Features

- One 2, 4 or 6-Core Intel® Xeon® 5500 or 5600 processors
- Intel® 5520 IOH36D / ICH10R server class chipset
- 6 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

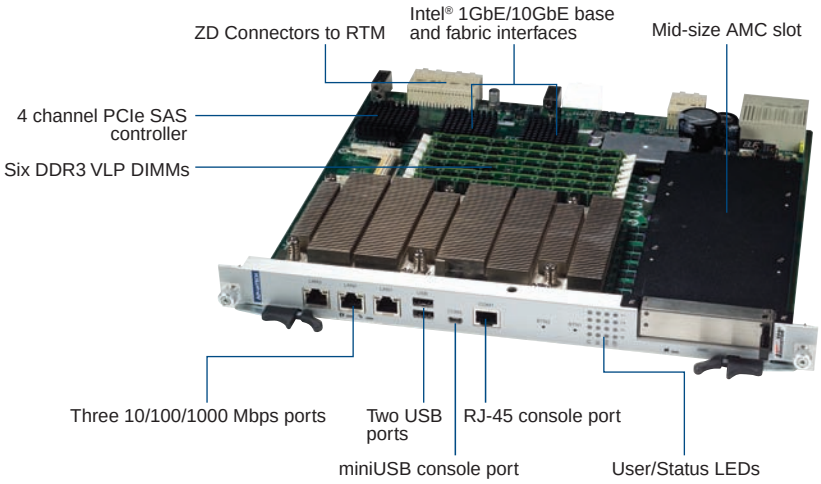
## Introduction

Advantech's MIC-5320 single-slot AdvancedTCA® processor blade combines computing performance with I/O flexibility in a power efficient design. Supporting Intel's latest Xeon® processors using the new Intel® Xeon® 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® Xeon® 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

| | | | |
|---|---|---|---|
| Processor System | CPU | L5508 (2C/4T), L5518 (4C/8T) or L5638 (6C/12T) Intel® Xeon® processor* | |
| | 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 | |
| Memory | Technology | Triple channel DDR3 1066/1333 MHz SDRAM (72-bit ECC Un-/ Registered) | |
| | Max. Capacity | Configurable up to 48 GB | |
| | Socket | 6 VLP DIMMs | |
| Zone 2 | Fabric Interface | i82599 Dual 10GE MAC/PHY supporting two 10 Gbps ports (XAUI) | |
| | Base Interface | i82576 PCIe dual GbE MAC/PHY supporting two 10/100/1000 Mbps ports | |
| Front I/O Interface | Serial (COM) | 2 x 16C550 compatible Serial Ports (1 RJ-45 connector, 1 miniUSB connector) | |
| | Ethernet | 2 x 10/100/1000 Mbps through PCIe based i82576 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, Microsoft Windows Server 2003, Windows Server 2008 | |
| IPMC | Controller | Renesas H8S/2166 | |
| | IPMI | Compliant with IPMI 1.5 using Pigeon Point System® (PPS) Solution | |
| Watchdog Timer | Supervision | 1 BMC, 1 x86 BIOS POST, OS Boot, Application | |
| | Interval | IPMI compliant | |
| AMC | Site | 1 mid-size AMC bay | |
| | Interface | SAS/SATA, PCI Express x4, RTM | |
| Miscellaneous | Storage | CF onboard, 4-port SAS controller LSI1064E (1 to AMC, 3 to zone 3) | |
| | Real Time Clock | Built-in | |
| Zone 3 (RTM) | RTM | Advantech common RTM interface Type 1 | |
| | Interface | 4x SAS, 2x PCIex4, 2x SGMII, 4x USB, 2x UART, 2x SATA, SGPIO, AMC ports 14, 17..20 | |
| Physical Characteristics | PCB Dimensions (W x D) | 6HP, 280.00 x 322.25 mm (11.02" x 12.69") | |
| | Weight | 2.675 kg | |
| Environment | | Operating | Non-operating |
| | Temperature | 0 ~ 55° C (32 ~ 131° F) | - 40 ~ 70° C (-40 ~ 158° F) |
| | 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 |
| Compliance | Environment | ETSI EN300019-2-1 Class1.2, EN300019-2-2 Class 2.3, ETSI EN300019-2-3 Class 3.1E<br>Designed to meet GR63-Core | |
| | PICMG | 3.0 R3.0, 3.1 R1.0, AMC.0 R2.0, AMC.1 R2.0, AMC.2, AMC.3, HPM.1 | |
| | Safety | CE mark (EN60950-2001), UL60950-1/CSAC22.2 | |
| | EMC | FCC47 CFR Part15, Class A, CE Mark (EN55022/EN55024/EN300386)<br>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

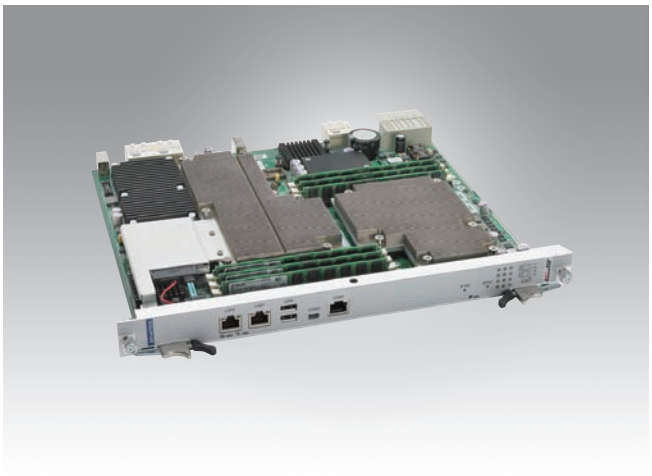
| Model number | Configuration |
|---|---|
| MIC-5320-S1E | MIC-5320 bare board |
| MIC-5320A0-S1E | MIC-5320 with 2C/4T CPU L5508 |
| MIC-5320A1-S1E | MIC-5320 with 4C/8T CPU L5518 |
| MIC-5320B1-S1E | MIC-5320 with 6C/12T CPU L5638 |

## Related Products

| Model number | Configuration |
|---|---|
| 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



## Features

- Two 2, 4 or 6-Core Intel® Xeon® 5500 or 5600 processors
- Intel® 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

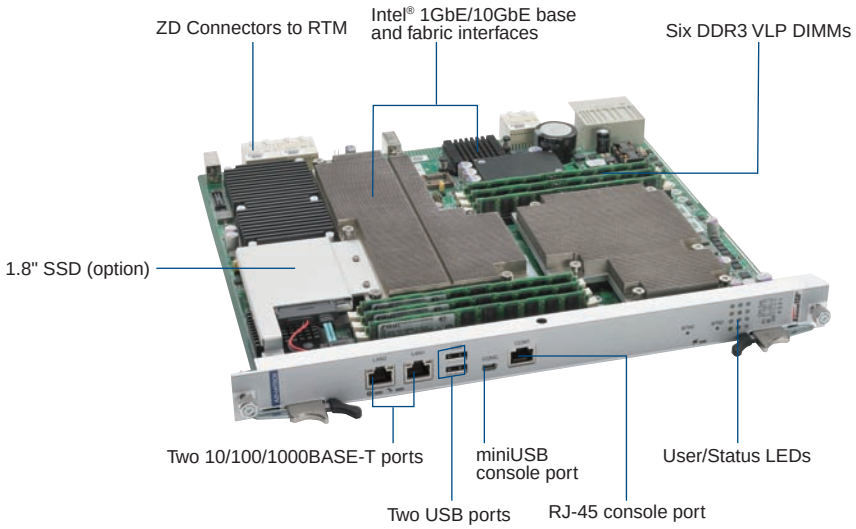
## Introduction

The MIC-5322 is a dual processor Intel® Xeon® 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® 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®(R) Xeon(R) 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.

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

| | | | |
|---|---|---|---|
| Processor System | CPU | L5518 (4C/8T), E5540 (4C/8T), L5638 (6C/12T) or E5645 (6C/12T) Intel® Xeon® processor | |
| | Max. Speed | 2.53 GHz | |
| | Chipset | Intel® IOH36D/ICH10R | |
| | BIOS | Dual 16-Mbit BIOS firmware flashes with AMI embedded BIOS | |
| Bus | QPI | 5.86 GT/s | |
| Memory | Technology | Triple channel DDR3 1066 / 1333 MHz SDRAM (72-bit ECC Un-/Registered) | |
| | Max. Capacity | Configurable up to 48 GB | |
| | Socket | 6 VLP DIMMs | |
| Zone 2 | Fabric interface | i82599 Dual 10GE MAC/PHY supporting two 10GBase KX4 ports (XAUI) | |
| | Base interface | i82576 PCIe dual GbE MAC/PHY supporting two 10/100/1000 Mbps ports | |
| Front I/O Interface | Serial (COM) | 2 x86 Serial Ports (1 RJ-45, 1 USB slave) | |
| | Ethernet | 2 10/100/1000BASE-T through PCIe based i82576 MAC/PHY | |
| | USB 2.0 | 2 Type A ports | |
| Operating System | Compatibility | WindRiver PNELE3.0, RedHat Enterprise 5.3, Microsoft Windows Server 2003, Windows Server 2008 | |
| IPMC | BMC Controller | Renesas H8S/2166 | |
| | IPMI | Compliant with IPMI 1.5 using Pigeon Point System® (PPS) Solution | |
| | Hardware Monitor | NuvoTon W83795ADG | |
| Watchdog Timer | Supervision | 1 BMC, 1 x 86 BIOS POST, OS Boot, Application | |
| | Interval | IPMI compliant | |
| Miscellaneous | LED Indicators | 12 | |
| | Storage | Onboard 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 | 3PCIe x 4, 2 x SATA, 2 x SGMII, 2 x USB, 2 x UART, SGPIO | |
| Physical Characteristics | Dimensions (W x D) | 6HP, 294.56 x 322.25 mm (11.60" x 12.69") | |
| | Weight | 2.545 kg | |
| Environment | | Operating | Non-operating |
| | Temperature | 0 ~ 55° C (32 ~ 131° F) | - 40 ~ 70° C (-40 ~ 158° F) |
| | 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 |
| 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, 3.1 R1.0, HPM.1 | |
| | Safety & EMC | CE mark (EN60950-2001), UL60950-1/CSAC22.2<br>FCC47 CFR Part15, Class A, CE Mark (EN55022/EN55024/EN300386)<br>Designed to meet GR1089-Core | |

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

## Ordering Information

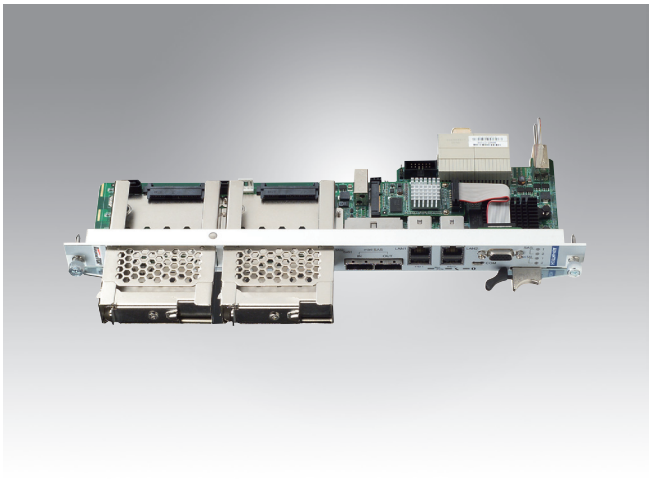
| Model number | Configuration |
|---|---|
| MIC-5322S1-P0E | 10GbE Ethernet fabric interface, bare board no CPUs, no memory, no CF disk |
| MIC-5322S1-P1E | 10GbE Ethernet fabric interface, Dual Intel® Xeon L5518 CPUs, no memory, no CF disk |
| MIC-5322S1-P2E | 10GbE Ethernet fabric interface, Dual 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

| Model number | Configuration |
|---|---|
| RTM-5101-A1E | RTM Module (hosts LSi1064e SAS controller and two hotswappable SAS HDD and rear panel IO connectors) |

# RTM-5101

## AdvancedTCA® RTM for CPU Blade

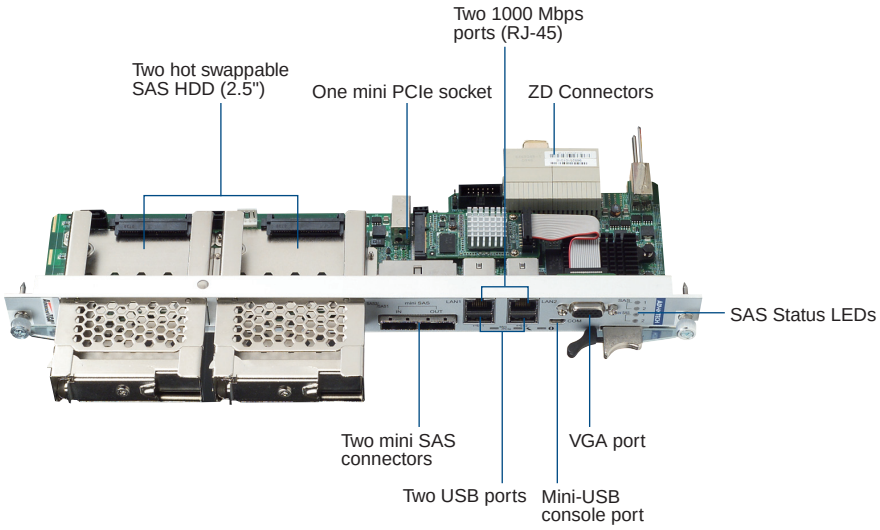


## Features

- 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

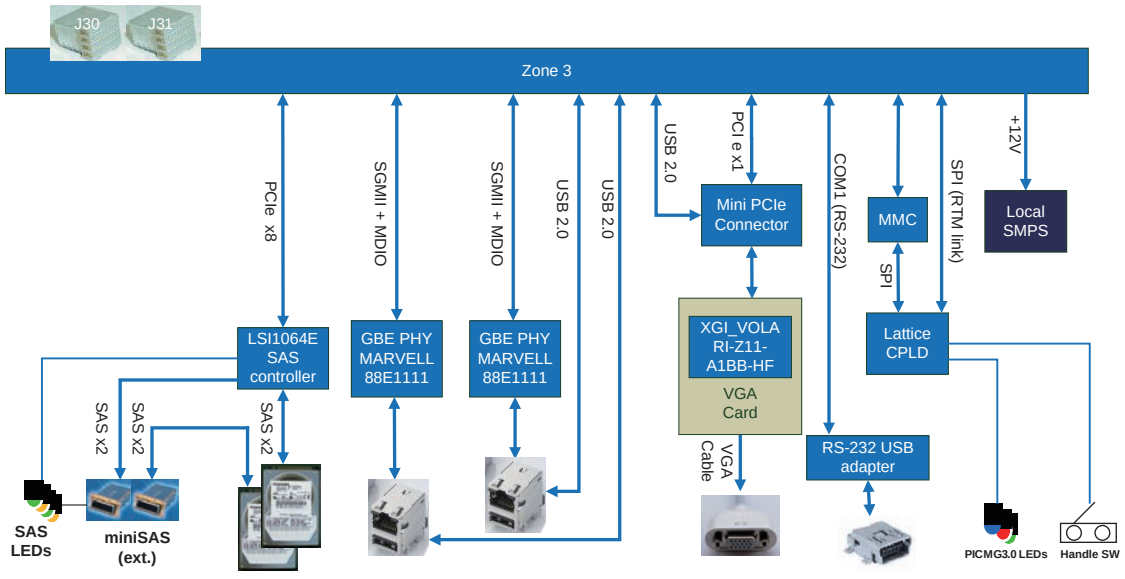
The RTM-5101 is a single slot (6HP) ATCA rear transition module for I/O extension of Advantech ATCA CPU blades. To meet serviceability, RTM-5101 is designed as a fully managed, and hot swappable FRU. On board SAS controller (LSI logic: LSI1064) supports two 2.5" hot swappable SAS HDDs which operates 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

| | | | |
|---|---|---|---|
| Rear Panel Interface | Serial (COM) | One mini USB connector (USB slave type) | |
| | Ethernet | Two 1000 Mbps ports | |
| | 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) | |
| IPMI | MMC Controller | Atmel ATMega128L | |
| | IPMI | Compliant with IPMI 1.5 using Pigeon Point System® (PPS) Solution | |
| Zone 3 | RTM | Advantech common RTM interface Type 1 | |
| | Interface | Three PCIe x 4, Two SATA, Two SGMII, Two USB, 1 x UART, GPIO, MMC management interface | |
| Power Requirements | | 8W typical without hard drives<br>18W typical with two hard drives | |
| Physical Characteristics | Dimensions (W x D) | 6HP, 322.25 x 94 mm (PCB size)<br>PS: 322.25 x 123.92 mm (the width to HDD's edge that extends out of rear panel) | |
| | Weight | 1.15 kg kg with two hard drives<br>0.6 kg without hard drives | |
| Environment | | Operating | Non-operating |
| | Temperature | 0 ~ 55° C (32 ~ 131° F) | - 40 ~ 70° C (-40 ~ 158° F) |
| | Humidity | 5 to 93%@40°C (non condensing) | 95% @ 40° C (non-condensing) |
| | 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)<br>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 | |
| | Safety & EMC | CE mark (EN60950-2001), UL60950-1/CSAC22.2<br>FCC47 CFR Part15, Class A, CE Mark (EN55022/EN55024/EN300386)<br>Designed to meet GR1089-Core | |

## Block Diagram




## Ordering Information

| Model number | Configuration |
|---|---|
| RTM-5101-A1E | RTM Module hosts SAS controller with VGA daughter card |

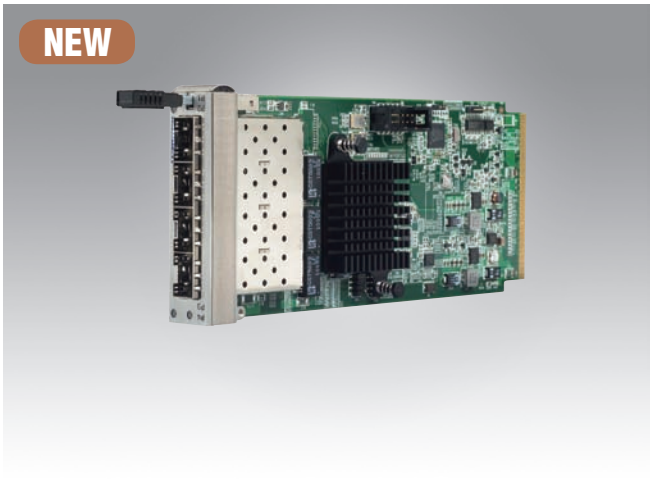
NOTE: Advantech may make changes to specification and product descriptions at any time, without notice.

## Related Products

| Model number | Configuration |
|---|---|
| MIC-5320 series | ATCA CPU blade with single Intel® Xeon CPU |
| MIC-5322 Series | ATCA CPU blade with dual Intel® Xeon CPUs |

# MIC-5203

## Advanced Mezzanine Card
## Quad Gigabit Ethernet AMC




## Features

- Intel® 82580 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® 82580 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®82580 which provides Intel® 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 PCIex4 (AMC Ports 4..7) host interface. The PCIe reference clock can be supplied over FLCKA or an onboard oscillator for systems which do not supply a PCIe reference clock. The MIC-5203 is compliant with both AMC.0 R1.0 and R2.0 specifications.

## Specifications

| | | | |
|---|---|---|---|
| Controller | Controller | Intel® 82580EB quad GbE MAC/PHY | |
| | Virtualization technologies | VMDq, VT-c | |
| | IP | IPv4, IPv6 | |
| | Queues | 8RX, 8TX per port | |
| | Offloading | TCP, UDP, SCTP | |
| IO | LEDs | AMC FRU LEDs, Network Link, Activity and Speed | |
| Software | Operating Systems | Linux, Windows | |
| | Boot | PXE, iSCSI | |
| Power Requirement | | 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 |
| Physical Characteristics | Dimensions (W x D) | 180.6 mm x 73.5 mm; mid-size, single-width** | |
| | 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

| Model 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 |



Last updated : 9-Feb-2011

# MIC-5212

## 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® 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 PCIex4 (AMC Ports 4..7) or PCIex8 (AMC ports 4..11) host interface. The PCIe reference clock can be supplied over FLCKA or an onboard oscillator for systems which do not supply a PCIe reference clock. The MIC-5212 is compliant with both AMC.0 R1.0 and R2.0 specifications.

## Specifications

| | | | |
|---|---|---|---|
| Controller | Controller | Intel® 82599ES dual 10GbE MAC/PHY | |
| | Virtualization technologies | VMDq, VMDc, SR-IOV | |
| | IP | IPv4, IPv6 | |
| | Queues | 128RX, 128TX per port | |
| | Offloading | TCP, UDP, SCTP, FCoE | |
| | Security acceleration | Linksec IEEE802.1ae (AES-128 Authorization/Encryption)<br>IPSec (AES-128, 1024 SA's) | |
| IO | SFP+ | 2 sites with support for presence detect, status and ID EEPROM | |
| | LEDs | AMC FRU LEDs, Network Link and Activity | |
| Software | Operating Systems | Linux, Windows | |
| | Boot | PXE, iSCSI | |
| Power | Power Consumption | Payload Power (12V) | Management Power (3.3V) |
| | 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 mm 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. Pls contact your Advantech sales representative.

## Ordering Information

| Model 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

AdvancedMC™ FCC CE RoHS COMPLIANT 2002/95/EC

## 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.

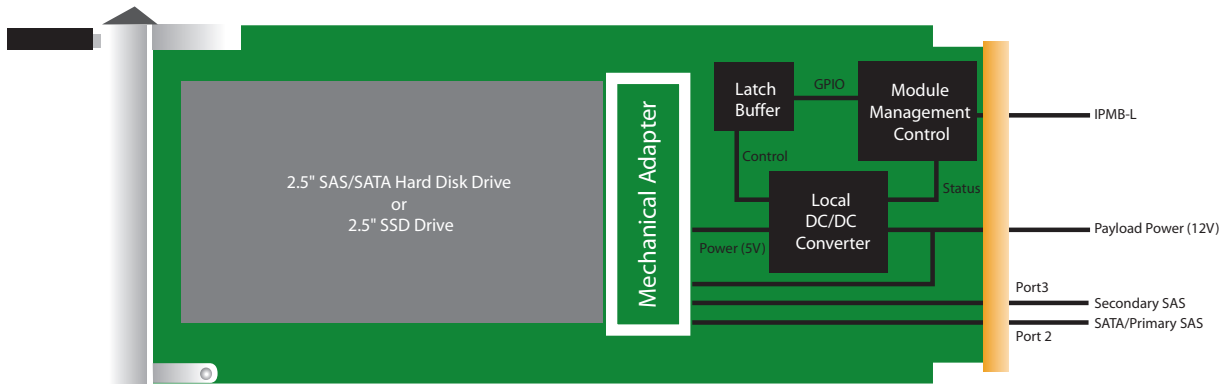
## Specifications

| | | |
|---|---|---|
| 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 | |
| | Redundant firmware images based on Pigeon Point Systems' solution supporting HPM.1 compliant upgrades and manual/automatic rollback | |
| Monitor | Power-on hour counter | |
| | 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) | |
| Environmental Conditions | 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) |
| | 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 (0.002G²/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) |
| Regulatory | Conformance | UL94V0, FCC Class B, CE, RoHS & WEEE compliant |
| | 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 |



Last updated : 9-Feb-2011

## Block Diagram




## Ordering Information

| Model Number | Front Panel |
|---|---|
| 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.

# MIC-5601

## Advanced Mezzanine Card
## Intel® Pentium® M Processor AMC

## Features

- Supports Intel® Pentium® M processor Low Voltage or Celeron® M processor Ultra Low Voltage
- Intel® 3100 chipset 400/533 MHz FSB
- 1 GB DDR2 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 PCIe x4, or single PCIe 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

AdvancedMC™ FCC CE RoHS COMPLIANT 2002/95/EC

## Introduction

The MIC-5601 is a highly integrated single-width, mid-size, processor AMC. Its design is based on the low-power, high-performance Intel® Celeron M ULV and Pentium M LV processors combined with the high-performance Intel® 3100 chipset. The board includes 1 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 MIC-5601 maximizes AMC edge connector connectivity for the best design flexibility. When redundancy or two separate interconnects are required, the board can be configured with two PCI Express x4 ports or with a single PCI Express x8 port when throughput is essential. Two gigabit Ethernet ports provide AMC.2 compliance and offer control and data plane connectivity to facilitate the migration of existing applications. Both ports 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.

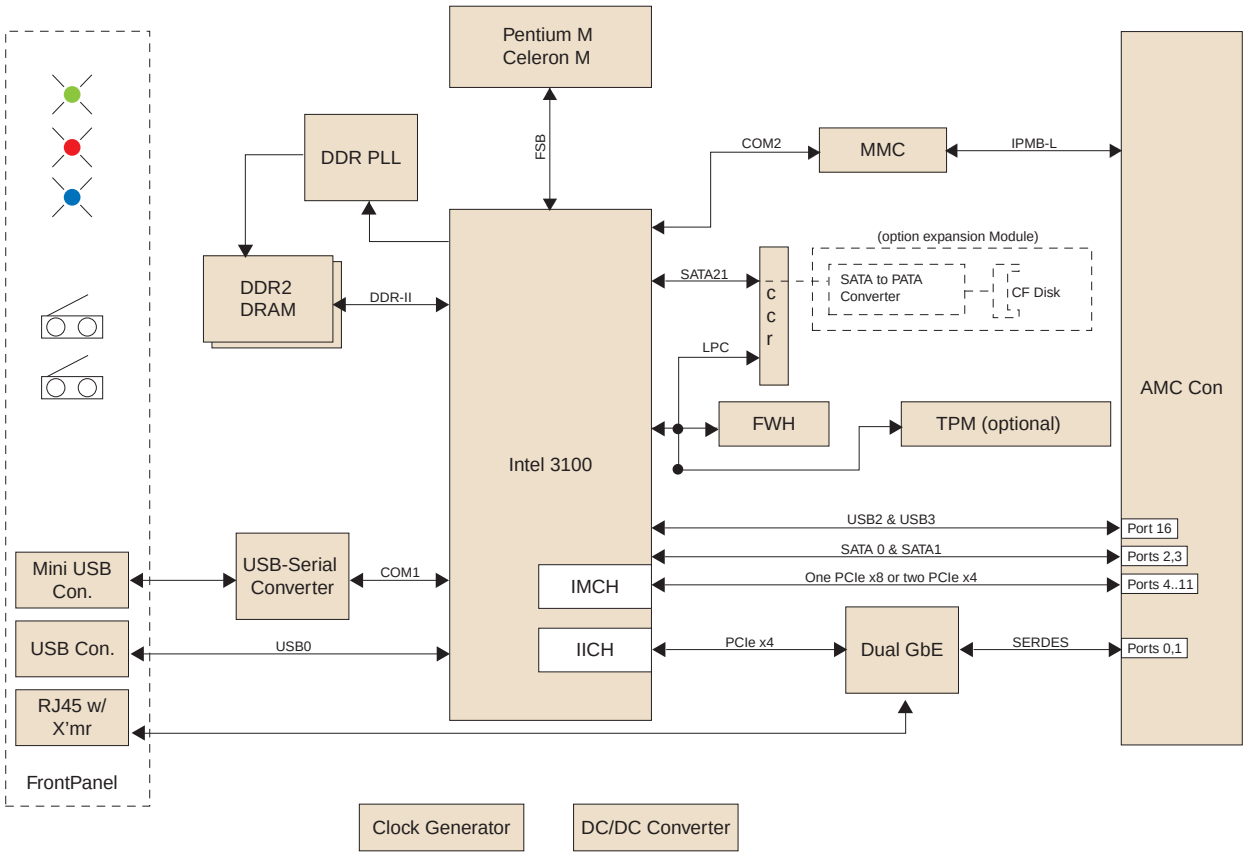
## Specifications

| | | |
|---|---|---|
| Processor System | CPU | Intel® Celeron M ULV (373) or Pentium M LV (738) up to 1.4 GHz |
| | Chipset | Intel® 3100 |
| | BIOS | AMI (1. Dual images with update rollback, 2. CMOS settings can be changed over IPMI, and 3. CMOS backup works without battery) |
| Bus | Front Side Bus | 400/533 MHz |
| | PCI Express | PCI Express rev1.0a : one x8 and two x4 routed to AMC connector |
| Memory | Technology | DDR2 400 with ECC |
| | Max. Capacity | 1 GB |
| Ethernet | Controller | Intel® 82571EB dual-port Gigabit Ethernet controller (supports 802.3d compliant link aggregation) |
| | 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 |
| USB 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 |
| | Update Standard | HPM.1 compliant |
| Operating System | Compatibility | Carrier Grade Linux (Wind River Platform for Network Equipment, Linux Edition 2.0) |
| Form Factor | AMC | Mid-size, single width |
| | 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 | Pentium M 738 LV + 3100 + 1 GB on-board DDR2 SDRAM |
| | Consumption | 31.2 watts |
| Physical | Dimensions | 180.6 mm x 73.5 mm |



Last updated : 9-Feb-2011

## Block Diagram




| | | | |
|---|---|---|---|
| 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 ( 0.002 G2/Hz, 1 Grms) | |
| | 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 | 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

| Model Number | On-Board Option | |
|---|---|---|
| | CPU | Memory |
| MIC-5601A-M1E | Pentium M LV 1.4 GHz (738) | 1 GB DDR2 with ECC |
| MIC-5601B-M1E | Celeron M ULV 1 GHz (373) | 1 GB DDR2 with ECC |

Notes:

1. TPM support will be available as an option.
2. Full size front panel design will be available upon request.
3. CF module available as an option.
4. Operating Temperature: depending on the actual air flow through the AMC slot

# MIC-5602

## Advanced Mezzanine Card
## Intel® Core™2 Duo Processor AMC

## Features

- Supports Intel® Core™2 Duo processor Low Voltage and Ultra Low Voltage
- Intel® 3100 chipset 400/533 MHz FSB
- Up to 2 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 PCIe x4, or single PCIe 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-5602 is a highly integrated single-width, mid-size, processor AMC. Its design is based on the low-power, high-performance Intel® Core™2 Duo LV and ULV processors combined with the high-performance Intel® 3100 chipset. The board includes 1 or 2 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 MIC-5602 maximizes AMC edge connector connectivity for the best design flexibility. When redundancy or two separate interconnects are required, the board can be configured with two PCI Express x4 ports or with a single PCI Express x8 port when throughput is essential. Two gigabit Ethernet ports provide AMC.2 compliance and offer control and data plane connectivity to facilitate the migration of existing applications. Both ports 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.

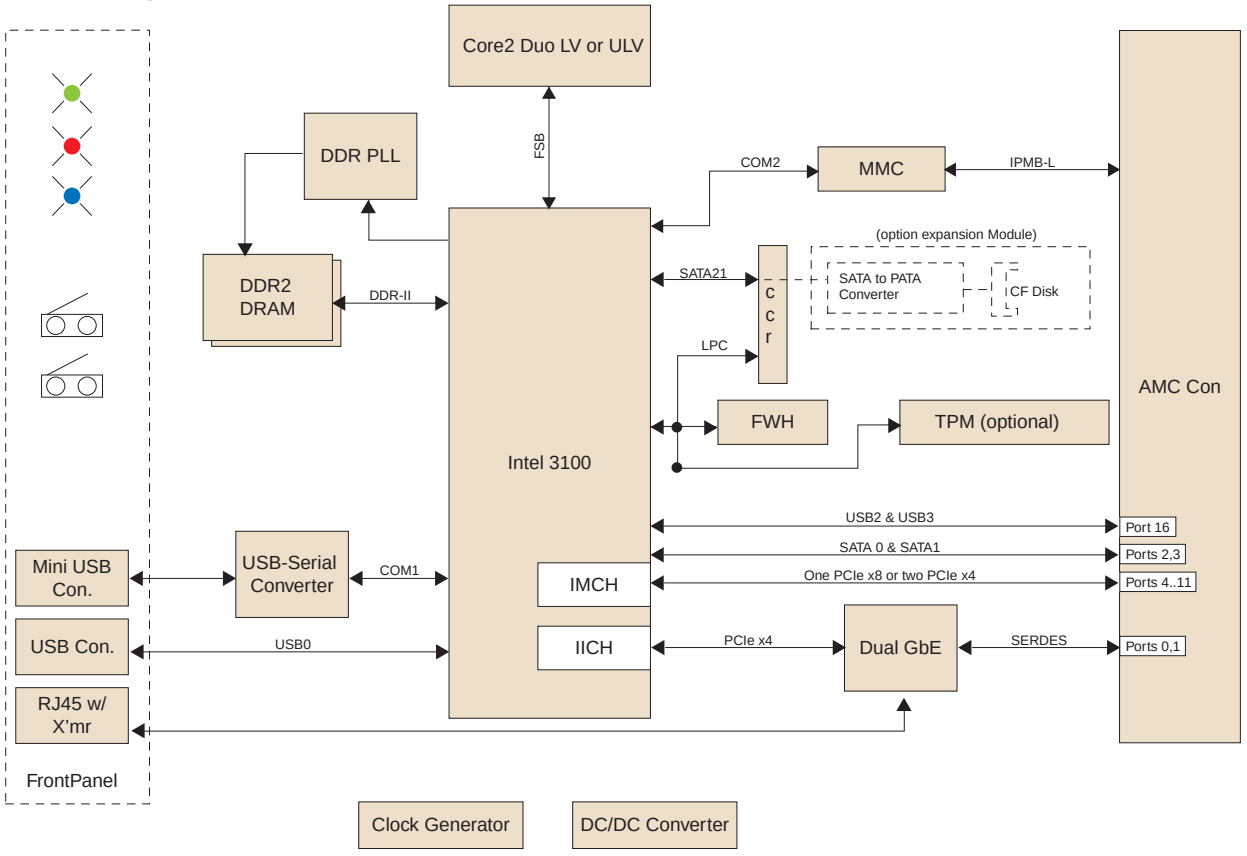
## Specifications

| | | |
|---|---|---|
| Processor System | CPU | Intel® Core™2 Duo ULV (U7500) and LV (L7400) up to 1.5 GHz |
| | Chipset | Intel® 3100 |
| | BIOS | AMI (1. Dual images with update rollback, 2. CMOS settings can be changed over IPMI, and 3. CMOS backup works without battery) |
| Bus | Front Side Bus | 400/533 MHz |
| | PCI Express | PCI Express rev1.0a : one x8 and two x4 routed to AMC connector |
| Memory | Technology | DDRII 400 with ECC |
| | Max. Capacity | 2 GB |
| Ethernet | Controller | Intel® 82571EB dual-port Gigabit Ethernet controller (support 802.3d compliant link aggregation) |
| | 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 |
| USB 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 |
| | Update Standard | HPM.1 compliant |
| Operating System | Compatibility | Carrier Grade Linux (Wind River Platform for Network Equipment, Linux Edition 2.0) |
| Form Factor | AMC | Mid-size, single width |
| | 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 L7400 + 3100 + 1 GB on-board DDRII SDRAM |
| | Consumption | 38.5 watts |
| Physical | Dimensions | 180.6 mm x 73.5 mm |



Last updated : 9-Feb-2011

## Block Diagram




| | | | |
|---|---|---|---|
| Environment | | Operating | Non-operating |
| | Temperature | -5 ~ 55° C (23 ~ 122° F) Note 6 | -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 | 300 m below 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

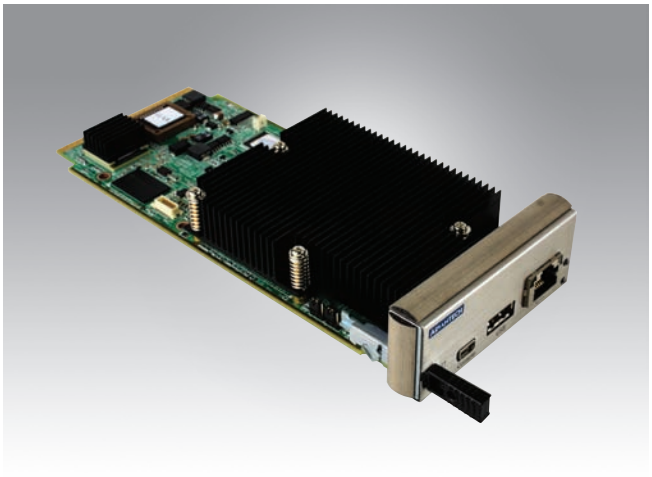
| Model Number | On-Board Option | |
|---|---|---|
| | CPU | Memory |
| MIC-5602A-M1E | Core™2 Duo LV 1.5 GHz (L7400) | 1 GB DDR2 with ECC |
| MIC-5602A-M2E | Core™2 Duo LV 1.5 GHz (L7400) | 2 GB DDR2 with ECC |
| MIC-5602B-M1E | Core™2 Duo ULV 1.06 GHz (U7500) | 1 GB DDR2 with ECC |
| MIC-5602B-M2E | Core™2 Duo ULV 1.06 GHz (U7500) | 2 GB DDR2 with ECC |

Notes:

1. TPM support will be available as an option.
2. Full size front panel design will be available upon request.
3. CF module available as an option.
4. Low cost Celeron M ULV 1.06 GHz (423) on request.
5. MIC-5602A-M2E and MIC-5602B-M2E builds will depend on the availability of the 2 GB DDR2 SDRAM from the memory manufacturers. Check with your local Advantech sales for further information.
6. Operating Temperature: depending on the actual air flow through the AMC slot

# MIC-5602Rev2

## Advanced Mezzanine Card Intel® 45 nm Core™2 Duo Processor AMC



## Features

- Supports Intel® 45 nm Core™2 Duo Low Voltage processor
- Intel® 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 PCIe x4, or single PCIe 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

AdvancedMC™ FCC CE RoHS COMPLIANT 2002/95/EC

## 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® 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

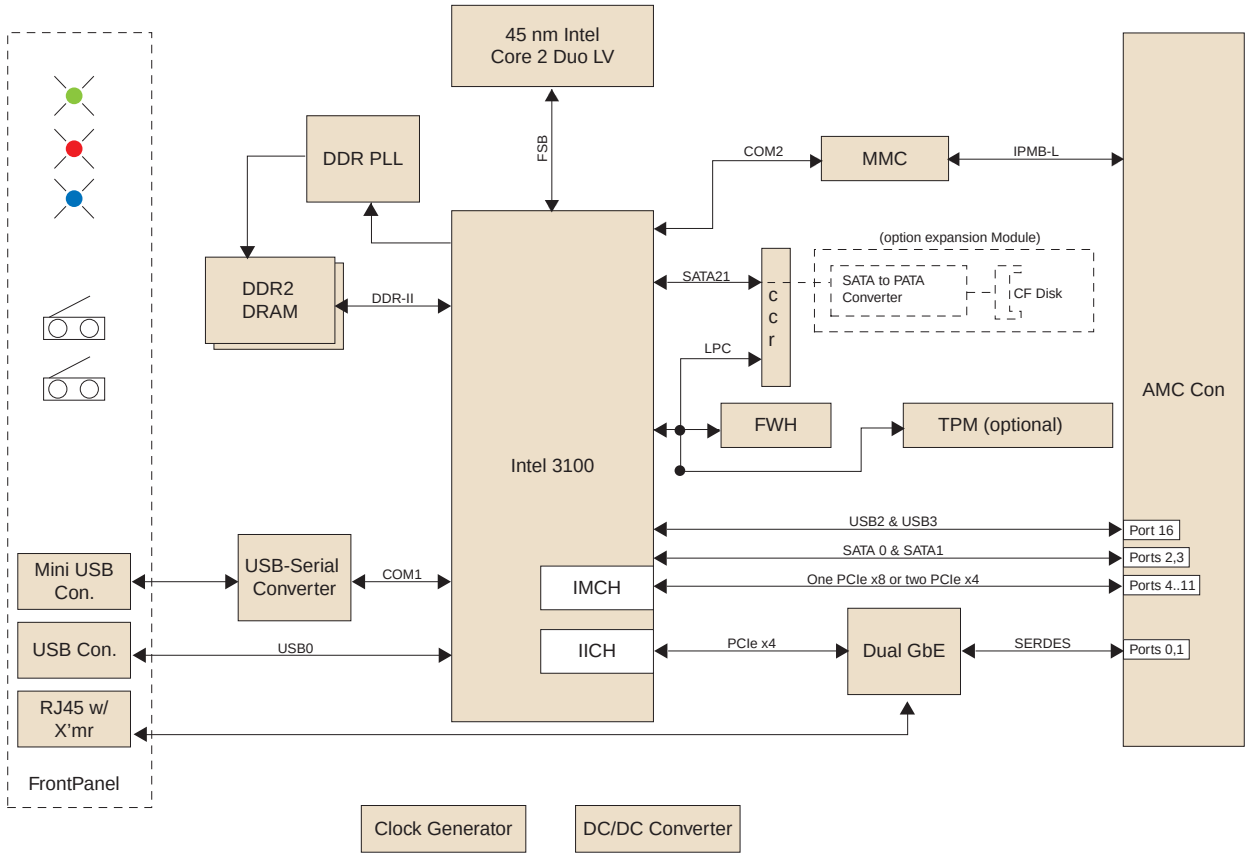
| | | |
|---|---|---|
| Processor System | CPU | Intel® Core™2 Duo SL9380 (1.8 GHz) |
| | Chipset | Intel® 3100 |
| | BIOS | AMI (1. Dual images with update rollback, 2. CMOS settings can be changed over IPMI, and 3. CMOS backup works without battery) |
| Bus | Front Side Bus | 800 MHz |
| | PCI Express | PCI Express rev1.0a : one x8 and two x4 routed to AMC connector |
| Memory | Technology | DDRII 400 with ECC |
| | Max. Capacity | 4 GB |
| Ethernet | Controller | Intel® 82571EB dual-port Gigabit Ethernet controller (support 802.3d compliant link aggregation) |
| | 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 |
| USB 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 |
| | 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) |
| | 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 | Dimensions | 180.6 mm x 73.5 mm |





Last updated : 9-Feb-2011

## Block Diagram




| | | | |
|---|---|---|---|
| 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

| Model Number | On-Board Option | |
|---|---|---|
| | 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 |

Notes:
1. TPM option is available on request.
2. CF module option is available as standard configuration.
3. 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.
4. Operating Temperature: depending on the actual air flow through the AMC slot.

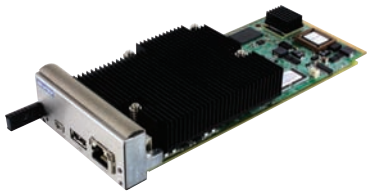
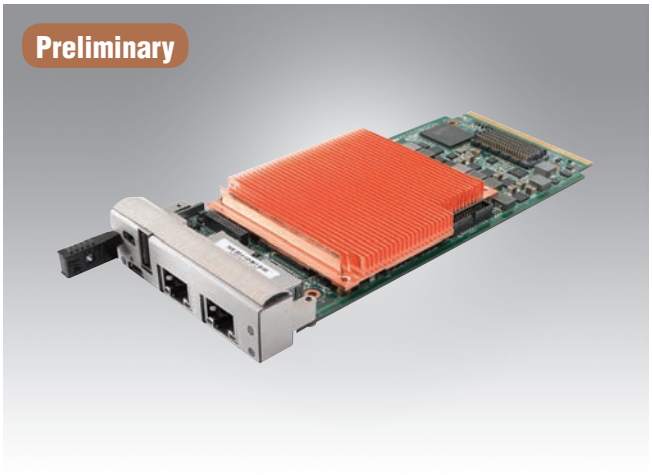


Figure 1: MIC-5602A2-M2E with Full-Size Front Panel

# MIC-5603

## Advanced Mezzanine Card based on 2nd Generation Intel® Core™ Processors with ECC




## Features

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

AdvancedMC™ FCC CE RoHS COMPLIANT 2002/95/EC

## 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 2nd generation Intel® Core™ processors in a BGA package combined with the Intel® 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 8GB, dual-channel, on-board DDR3 memory with ECC at 1333MHz, 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® HD graphics controller with DX10.1 and OpenGL 3.0 capabilities.

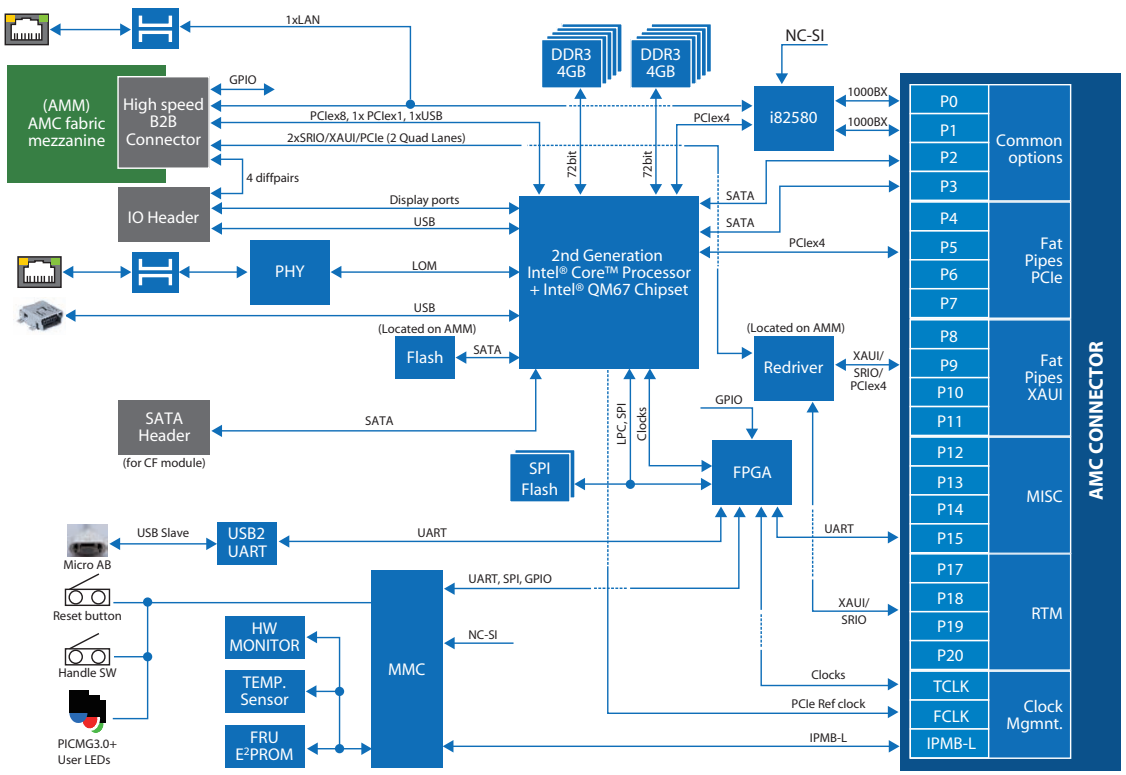
As standard feature, external Ethernet connectivity is provided on two dedicated GbE front panel ports, one each from the Intel® QM67 PCH and the onboard Intel® 82580 quad port LAN controller, which also provides two additional GbE ports to the AMC base fabric. The Intel® PCH brings new and enhanced 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

| | | |
|---|---|---|
| Processor System | CPU | Intel® 2nd Generation Core™ i3/i5/i7 mobile processors up to 2.3 GHz (4MB L2 cache) |
| | Max. Speed | 2.3GHz |
| | PCH | Intel® QM67 |
| | BIOS | UEFI BIOS based on AMI<br>(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 and 1333MT/s SDRAM with ECC. |
| | Max. Capacity | 8 GB RAM (soldered on-board memory) |
| Ethernet | Controllers | Intel® 82580EB Quad-port Gigabit Ethernet controller |
| | Interface | One GbE accessible on front panel via RJ-45 and two SerDes links to AMC ports 0 and 1 |
| Front I/O Interface | Serial (COM) | One x86 Serial Port<br>(USB slave connector through onboard USB to Serial converter) |
| | Ethernet | Two 10/100/1000BASE-T through PCIe based Intel® 82580 & 82579 MAC/PHY |
| | USB 2.0 | One port (Type A) |
| Mass Storage | CompactFlash | Optional CF module with CFast socket **NOTE1** |
| | Onboard | 8 or 16GB industrial grade internal flash disk (optional) |
| SATA | | |
| Interfaces | AMC edge connector | Two SATA interfaces (6Gbps) to common option ports 2..3 |
| | Other | One SATA routed to CF daughter board (optional) |
| Operating System | Compatibility | WindRiver PNE-LE 3.0, RHEL, CentOS, Windows Server 2008 |
| System Management | MMC | NXP LPC1768 |
| | 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 |
| | Interval | IPMI compliant |

## Block Diagram




| | | | |
|---|---|---|---|
| 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 | |
| Power Consumption | Configuration | Intel® Core i7-2610UE + QM67 + 8GB on-board DDR-III memory | |
| | TDP (Estimated) | 40W max. | |
| Physical | Dimensions | Mid-size (or Full-size), 180.6 mm x 73.5 mm | |
| Environment | | Operating | Non-operating |
| | Temperature | -5 ~ 55° C (23 ~ 131° F) **NOTE2** | - 40 ~ 70° C (-40 ~ 158° F) |
| | Humidity | IEC60068-2-78 (95%RH @ 40° C) | |
| | Vibration (5 ~ 500Hz) | IEC60068-2-6 (0.002G2/Hz, 1Grms) | |
| | Shock | IEC60068-2-27 (10G, 11ms) | |
| | Altitude | 4,000m above sea level | 10,000m 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 | |

## Ordering Information

| Model Number (NOTE3, NOTE4) | Description |
|---|---|
| MIC-5603AFZ-M4E | Full-size front panel, 4GB DDR3 with ECC, AMC Mezzanine Module with optional on-board flash |
| MIC-5603AFZ-M8E | Full-size front panel, 8GB DDR3 with ECC, AMC Mezzanine Module with optional on-board flash |
| MIC-5603AM-M4E | Mid-size front panel, 4GB DDR3 with ECC, CFast module with optional on-board flash |
| MIC-5603AM-M8E | Mid-size front panel, 8GB DDR3 with ECC, CFast module with optional 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: CF/CFast module and the AMC Mezzanine Module are mutually exclusive
NOTE 2: Operating Temperature: depending on the actual air flow through the AMC slot
NOTE 3: For lower or higher on-board memory support, please contact your local Advantech sales for options
NOTE 4: For full-size front panel sku the Intel® Core i7-2655LE processor is supported by default; for mid-size front panel sku the Intel® Core i7-2610UE processor is supported by default.

# AMC-4201

## Advanced Mezzanine Card Freescale QorIQ P4080 AMC


## Features

- Freescale P4080 8 Cores 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 (SRIO/XAUI/PCIe) 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® 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® 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.

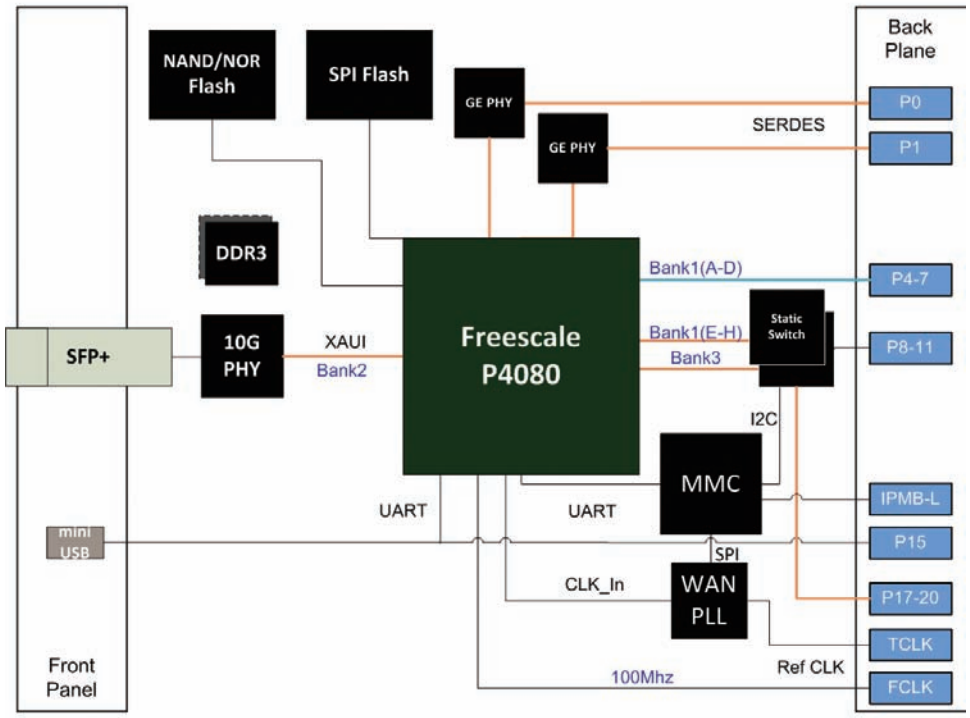
## Main Carrier Board Specifications

| | | | |
|---|---|---|---|
| Processor system | CPU | Freescale QorIQ P4080 8 Cores e500-mc PowerPC, up to 1.5 Ghz | |
| | Bootloader | U-boot | |
| Boot Device | SPI Flash | Spansion S25FL032P0XMFI011, 4 MB | |
| | NAND Flash | Micron MT29F16G08ABABAWP, 2 GB | |
| Memory | Technology | DDR III with ECC, up to 1333 MHz | |
| | Max. Capacity | 8 GB | |
| Ethernet | Controller | Netlogic AEL1010 | |
| | Interface | One 10 GbE SFP+ port for external access | |
| Hardware Monitor | Controller | IPMI v1.5 compatible MMC | |
| Firmware | Source code | Pigeon Point System-based | |
| | Update Standard | HPM.1 compliant | |
| Operation System | Compatibility | Linux | |
| Form Factor | AMC | Mid-size, single width | |
| | Interface | AMC.0 compliant and Configurable SERDES channel support:<br>- PCIe: AMC.1 compliant with port 4-7,8-11<br>- Ethernet: AMC.2 compliant with port 8-11.<br>- SRIO: AMC.4 compliant with port 4-7, 8-11 | |
| Power Consumption | Max | 40 W | |
| | Typical | Less than 32 W | |
| Physical | Dimension | 180.6 mm x 73.5 mm | |
| Environment | | Operating | Storage |
| | Temperature | -5 ~ 55° C | -40 ~ 70° C |
| | Humidity | IEC60068-2-78 (95%RH @ 40° C) | |
| | Vibration | IEC60068-2-6 (0.002 $G^2$/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 Compliance | Conformance | UL94V0, FCC Class B, CE, RoHS & WEEE Ready | |
| | Standards | PICMG AMC.0, AMC.1, AMC.2, AMC.4, IPMI v1.5, HPM.1, NEBS Level 3 | |



Last updated : 9-Feb-2011

## Block Diagram




## Ordering Information

| Model number | Configuration |
|---|---|
| AMC-4201-0XAE | AMC-4201 with P4080-1.5 GHz and 8 GB DDR3-1333 MHz memory |
| AMC-4201-1XAE | AMC-4201 with P4080-1.5 GHz and 4 GB DDR3-1333 MHz memory |

**X based on different SerDes configuration**

| Port | Port Area | The value of X | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| P4-7 | Fat pipe | PCIex4 (Gen2) | PCIex4 (Gen2) | PCIex4 (Gen2) | PCIex4 (Gen2) | SRIO (2.5G) |
| P8-11 | | 4x SGMII | SRIO (2.5G) | PCIex4 (Gen2) | XAUI | SRIO (2.5G) |

# UTCA-5503

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

## Features

- Layer 2 GbE switch for up to 12 AdvancedMC™ 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.

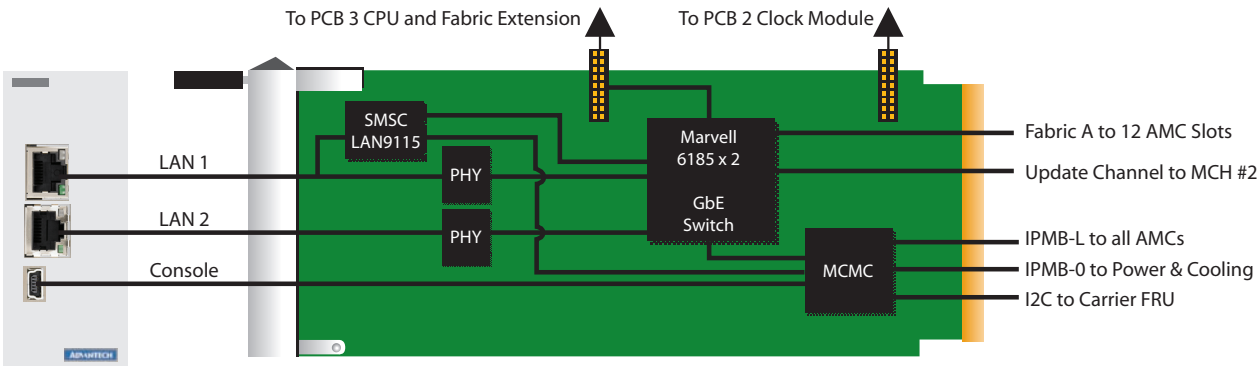
### Clocks and Alarms

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.



Last updated : 9-Feb-2011

## Block Diagram




## Ordering Information

| Model 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 |

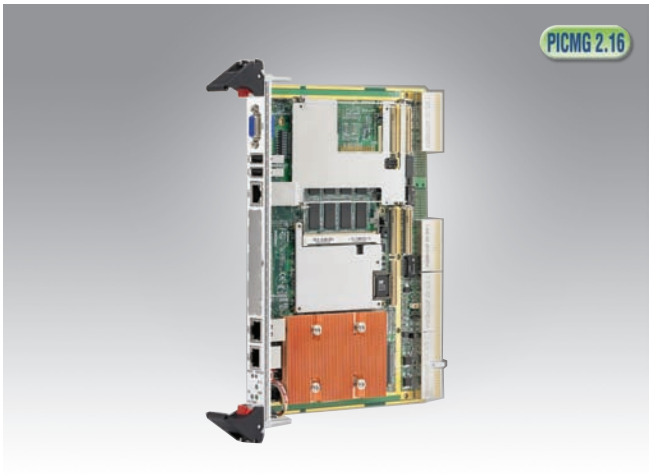
Note: Model with management only (no switch) will be available upon request. Please contact local sales representative for details.

## 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.

# MIC-3392L

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




## Features

- Supports Intel® Celeron® M 440 processor
- Intel® 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

| | | |
|---|---|---|
| Processor System | CPU (Included) | Intel® Celeron® M 440 Processor,1.86 GHz, 1 MB L2 cache |
| | Chipset | Intel®945GME/ICH7M |
| | BIOS | AMI 8 Mbit flash |
| Bus | Front Side Bus | 533 MHz |
| | PCI | Up to 64-bit/66 MHz |
| Memory | Technology | DDR2 533/667 MHz |
| | Max. Capacity | 2 GB |
| | Socket | SODIMM x 1<br>1 GB memory integrated on board |
| Graphics | Controller | Intel® 945GME integrated |
| | 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) |
| 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 |
| | 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. |
| PMC | Site | 1 |
| | Interface | IEEE1386.1 64-bit/66 MHz |
| | Signal | +5V/+3.3V compliant |
| Miscellaneous | Solid State Disk | One CompactFlash socket |
| | LEDs | HDD, Power, Hot Swap, system/peripheral, BMC Heartbeat |
| | USB 2.0 | 2 channels |
| | Real Time Clock | Built-in to South Bridge |

## Specifications Cont.

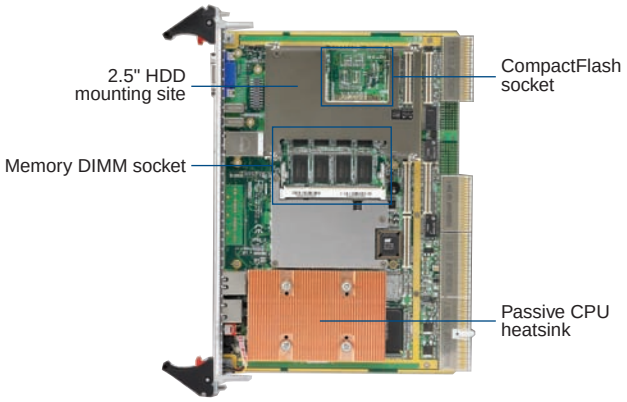
| | | | |
|---|---|---|---|
| Power Requirement | TDP | Max. 44 watts | |
| Physical | Dimension | 233.35 x 160 mm (9.19" x 6.3"), 1-slot width | |
| | Weight | 0.8kg (1.76lb) | |
| Environment | | Operating (by screening service) | Non-operating |
| | Temperature | 0 ~ 55° C (32 ~ 122° F) | -20 ~ 60° 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 | |
| Regulatory | Conformance | FCC Class A, CE, RoHS | |
| | NEBS Level 3 | Designed for GR-63-Core and GR-1089-Core | |
| Compliance | Standards | PICMG 2.0, R3.0 CompactPCI Specification<br>PICMG 2.1, R2.0 Hot-Swap Specification<br>PICMG2.9, R1.0 IPMI Specification<br>PICMG2.16, R1.0 Packet Switching Backplane Specification | |

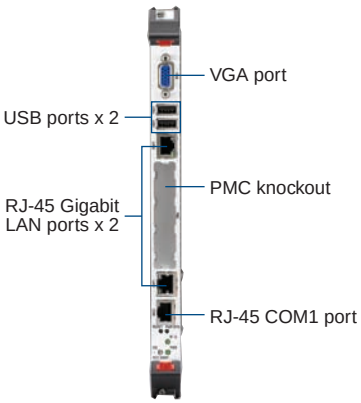
## Recommended Configurations

| 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

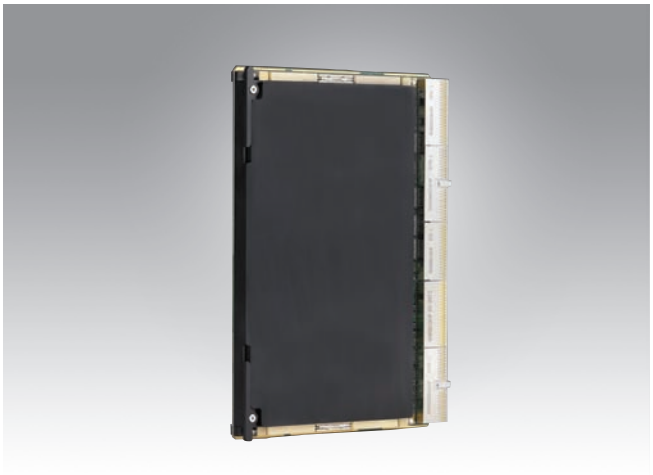
| Model Number | Front Panel I/O | | | | | On-Board Option | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | LAN | COM | PMC | USB | VGA | CPU | Memory | CF socket | Storage Channel | Slot Width |
| MIC-3392LE | 2 | 1 | 1 | 2 | 1 | Celeron M 440 | 1 GB | 1 | 1 | 1 |



# MIC-3392MIL

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



## Features

- Supports Intel® Core™ Duo Low Voltage or Core™2 Duo Ultra Low Voltage mobile processor
- Intel® 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

CompactPCI® FCC CE RoHS COMPLIANT 2002/95/EC

## 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 from ruggedized applications. Based on the Intel® Core™ 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

| | | |
|---|---|---|
| Processor System | CPU | Intel® Core™2 Duo ULV or Core™ Duo LV up to 1.6 GHz (2 MB L2 cache) |
| | Chipset | Intel®945GME/ICH7M |
| | BIOS | Award 4Mb flash |
| CompactPCI Interface | J1 Connector | 32-bit PCI local bus |
| | J2 Connector | 64-bit PCI local bus |
| | J3~J5 Connectors | PICMG2.16 + RTM area |
| PCI-X to cPCI Bridge | Controller | PLX PCI 6540CB |
| | Interface | Master/Drone |
| Bus | Front Side Bus | 533/667 MHz |
| | PCI | Up to 64-bit/66 MHz |
| Memory | Technology | DDR2 533/667 MHz |
| | Max. Capacity | 3 GB |
| | Socket | SODIMM x1<br>2 GB memory integrated on board |
| Graphics | Controller | Intel® 945GME integrated |
| | VRAM | Dynamic |
| | Resolution | Up to 2048 x 1536, 64k color at 75 Hz |
| Ethernet | Controller | Intel® 82571EB dual-port Gigabit Ethernet controller |
| | Interface | 10/100/1000 Mbps Ethernet (on PCIe x4 channel) |
| | I/O Connector | PICMG2.16 and RJ-45 x2 (RTM rear panel) |
| | Controller | Intel® 82546GB dual-port Gigabit Ethernet controller |
| | Interface | 10/100/1000 Mbps Ethernet (on PCI 32bits/33Mhz) |
| | I/O Connector | RJ-45 x2 (RTM rear panel) |
| Storage | Mode | SATA |
| | Channel | 2 interfaces to CompactPCI connector |
| | 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 |



Last updated : 9-Feb-2011

## Specifications Cont.

| | | | |
|---|---|---|---|
| Expansion I/O | USB 2.0 | 2 host ports (std. USB connectors) on front panel and 4 host interfaces to cPCI connectors | |
| | DVI-I | 2 interfaces to CompactPCI connector | |
| | Serial | 3 interfaces to CompactPCI connector (1 reserved for BMC IPMI F/W update) | |
| | Parallel, FDD, PS2 | Each with 1 interface to CompactPCI connector | |
| Watchdog Timer | Output | Local Rest and Interrupt | |
| | Interval | Programmable 1s ~ 255s | |
| Hardware Monitor | Controller | Winbond 83627HG | |
| BMC | Controller | Renesas H8S 2167, IPMIv1.5 compliant for standard CompactPCI SKU/Pre-heat F/W for conduction-cool SKU, mutually exclusive | |
| Operating System | Compatibility | Windows® XP/2000, Linux, VxWorks 6.4 (on request) | |
| Miscellaneous | Front Panel LEDs (standard cPCI SKU only) | x1 blue/yellow for Hot Swap/HDD, x1 green for Master/Drone, x1 yellow BMC Heartbeat, and x1 green for Power | |
| Power Requirement | Configuration | Conduction cooled SKU (with Intel® U7500 processor) | |
| | TDP | 37 watts (thermal model available on request) | |
| Physical | Dimensions | 160.0 mm x 233.35 mm | |
| Environment | | Operating | Non-operating |
| | Temperature | 0 ~ 70° C (std CompactPCI SKU)<br>-40 ~ 70° C (conduction-cool with pre-heat) | -50 ~ 80° C |
| | Humidity | 5 ~ 85 % @ 45° C, non-condensing | 10 ~ 95 % @ 45° C, non-condensing |
| | 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 (without conformal coating) | 10,000m above sea level |
| Regulatory | Conformance | FCC Class A, CE, RoHS | |
| | 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 cPCI SKU), PICMG 2.16 R1.0, ANSI/VITA 30.1-2002 | |

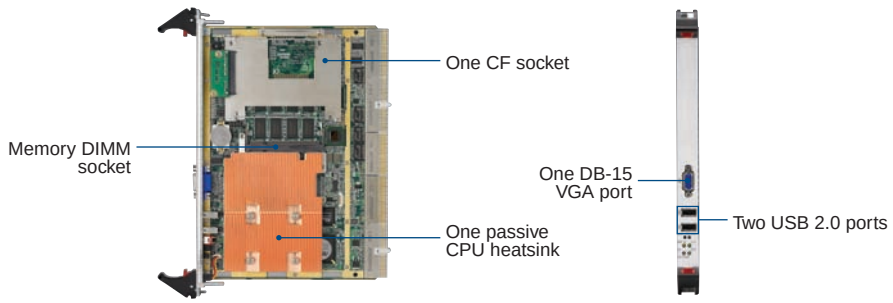
## Recommended Configurations

| 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

| System Board Model Number | Front Panel | | | | Conduction Cool | Main On-board Features | | | | | Conformal Coating |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | VGA | USB2.0 | BMC Reset | System Reset | | CPU | Memory | CF Socket | Storage Channel | SODIMM Socket | |
| 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 |

| RTM Model Number | Rear Panel | | | | | On-board Header/Socket/Connector | | | | | | | CPCI Conn. | Conformal Coating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAN | COM | DVI-I | PS2 | USB | IDE | FDD | LPT | SATA | COM Interface | Console Interface | USB Interface | | |
| 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

# MIC-3392Rev2

## 6U CompactPCI Intel® Core™2 Duo Processor-based Board with Dual PCIe GbE/DDR2/SATA/PMC


## Features

- Supports Intel® Core™2 Duo processor
- Intel® 945GME chipset supports 533/667 MHz FSB
- Up to 3 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, and optional second 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-3392 is a high performance, power efficient CompactPCI single board computer based on the Intel® Core™2 Duo processor. It combines the benefits of two execution Cores with Intel®ligent power management features to deliver significantly greater performance per watt over previous Intel® processors. The two execution Cores share a power-optimized 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

| | | |
|---|---|---|
| Processor System | 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) |
| | Max. Speed | 2.16 GHz (up to 4 MB L2 cache) |
| | Chipset | Intel® 945GME |
| | BIOS | AMI 8 Mbit flash |
| Bus | Front Side Bus | 533/667 MHz |
| | PCI | Up to 64-bit/100 MHz |
| Memory | Technology | DDR2 533/667 SDRAM |
| | Max. Capacity | 3 GB |
| | Socket | SODIMM x 1<br>1 GB/ 2 GB memory integrated on board |
| Graphics | Controller | Intel® 945GME integrated |
| | 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) |
| Storage | Mode | SATA |
| | Channels | 1 |
| | Storage Site | One SATA connector and space reserved for embedded 2.5" HDD |
| Bridge | Bus | PCI 64-bit/66 MHz |
| | 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. |
| PMC | Site | 1 or 2 |
| | Interface | IEEE1386.1 64-bit/66 MHz on A version<br>PMC1 and PMC2 are 64-bit/66 MHz on B version |
| | Signal | +5 V/+3.3 V compliant |

## Specifications Cont.

| | | | | | |
|---|---|---|---|---|---|
| Miscellaneous | Solid State Disk | One CompactFlash socket | | | |
| | LEDs | HDD, Power, Hot Swap, system/peripheral | | | |
| | USB 2.0 | 2 channels | | | |
| | Real Time Clock | Built-in to the South Bridge | | | |
| Power Requirement (Intel® Core™2 Duo 2 GHz with 2 GB memory) | Voltage | +3.3 V | +5 V | +12 V | -12 V |
| | Typical | 2.66 A | 3.04 A | 0.39 A | 0 A |
| | Maximum | 3.17 A | 7.16 A | 0.40 A | 0 A |
| Physical | Dimensions | 233.35 x 160 mm (9.19" x 6.3"), 1-slot width | | | |
| | Weight | 0.8 kg (1.76 lb) | | | |
| 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, 3.5 Grms | |
| | Altitude | 4000 m above sea level | | | |
| Regulatory | Conformance | FCC Class A, CE | | | |
| | NEBS Level 3 | Design for GR-63-Core & GR-1089-Core | | | |
| Compliance | Standard | PICMG 2.0, R3.0 CompactPCI Specification<br>PICMG 2.1, R2.0 Hot-Swap Specification<br>PICMG 2.9, R1.0 IPMI Specification<br>PICMG 2.16, R1.0 Packet Switching Backplane Specification | | | |

* 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,<br>MIC-3392B2-MxE | MIC-3665-AE, MIC-3665-BE | RIO-3310AE, RIO-3310S-A1E,<br>RIO-3310S-A2E | MIC-3042, MIC-3043 |

## Rear Transition Board

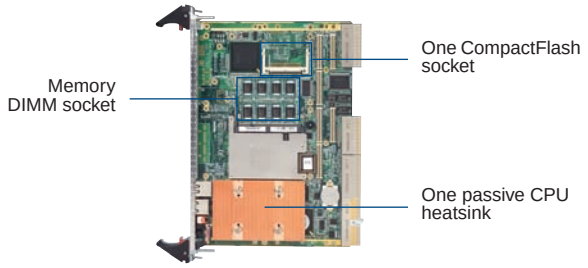
| Model | Rear Panel | | | | | | | Onboard Header/Socket/Connector | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | KB & Mouse | COM2 * | GbE LAN | VGA | USB | 10/100Base-T LAN | SCSI ** | IDE | SATA | FDD | SCSI** | PRT | USB | Slot Width | Conn. |
| RIO-3310S-A1E | 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 |

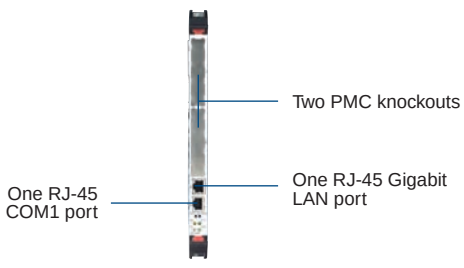
* Optional 3rd LAN port occupies the rear COM2 port

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

## Ordering Information

| Model Number | Front Panel I/O | | | | | Main Onboard Features | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | LAN | COM | 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 |

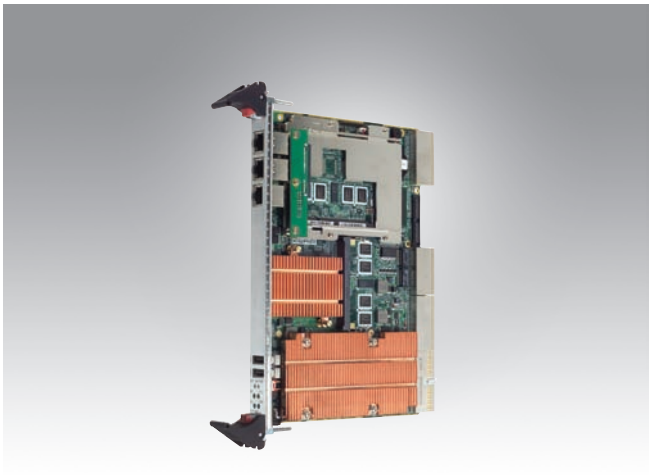



Note: These pictures are based on the "MIC-3392B2-M1E" model.

# MIC-3393

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



## Features

- Supports 45 nm Intel® Xeon® Low Voltage/Ultra Low Voltage processor
- Intel® 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® I/OAT technology for enhanced I/O performance
- PICMG 2.16 R1.0, PICMG 2.9 R1.0, PICMG 2.1 R2.0 compliant

CompactPCI® FCC CE RoHS COMPLIANT 2002/95/EC

## Introduction

Experience true server class performance on CompactPCI. Using Intel® 45nm 64-bit Xeon technology with up to four Cores at 2.33 GHz combined with the powerful Intel® 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 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

| | | |
|---|---|---|
| Processor System | CPU | Quad-Core™/Dual-Core™ Intel® Xeon® processor LV or Dual-Core™ Intel® Xeon® processor ULV up to 2.66 GHz |
| | Chipset | Intel® 5100MCH/ICH9R |
| | Front Side Bus | 1066/1333 MHz with parity protection |
| | BIOS | Redundant AMI 2MByte SPI flash |
| Memory | Technology | Dual channel DDR2 533/667 MHz with ECC |
| | Max. Capacity | 2 GB onboard, max. 6 GB total |
| | Socket | SODIMM x2 |
| CompactPCI Interface | J1~J2 Connectors | 64-bit/66 MHz PCI local bus + RTM |
| | J3 Connector | PICMG2.16 + RTM |
| | J5 Connector | RTM |
| | Bridge | Pericom PI7C9X130DNDE + PLX PCI 6540CB |
| | Mode | Sytem Master/Drone (Stand alone) |
| Ethernet | Controller | 2 Intel® 82574L single-port Gigabit Ethernet controllers |
| | Interface | 10/100/1000 Mbps Ethernet |
| | I/O Connector | PICMG2.16 x 1, RJ-45 x1 or RTM x 2 |
| | 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 |
| Graphics (on RTM) | Controller | XGI Volari Z11 PCIe Server graphics with 32 MB VRAM |
| | Resolution | Up to 1600 x 1200, 64k hi-color at 70Hz |
| Storage | Type | SATA-II |
| | Channels | 1 channel. to onboard SATA HDD carrier or CF disk carrier<br>2 channels. to RTM<br>2 channels to extension module (8HP only) |
| Front I/O | USB 2.0 | 2 type A |
| | COM | 1 RS-232 on RJ-45 |
| | 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 |





Last updated : 9-Feb-2011

# Specifications

| | | | |
|---|---|---|---|
| Rear I/O | USB | 4 ports | |
| | COM | 2 ports | |
| | LAN | 3 10/1000/1000 Mbps | |
| | SATA | 2 ports | |
| | PCIe | 1 PCIe x 1, 1 PCIe x 4 | |
| | Others | PS/2 for keyboard & mouse | |
| BIOS | CMOS | Battery backed up with backup copy in EEPROM | |
| | Boot Options | SATA, SAS, USB ports, USB flash disk, network (PXE) | |
| | Console | VGA or console redirection over COM Port, SoL supported by BMC | |
| | Other | Supports operation without disk, keyboard, video | |
| Watchdog Timer | Output | Local Reset and Interrupt | |
| | Interval | Programmable 1s ~ 255s | |
| Hardware Monitor | Controller | Winbond® 83627DHG: voltages, CPU, chipset, board temperature | |
| BMC | Controller | Renesas® H8S 2167, IPMIv2.0 compliant | |
| Operating System | Compatibility | Windows® XP 32/64 bit, Windows Server® 2008 32/64 bit, Linux | |
| Power Requirement | Configuration | 4HP | 8HP |
| | TDP (max./typ.) | 60W / <50W | 90W / <75W |
| Physical | Dimensions & Weight | 6U /1 slot width (4HP), 233.35 x 160 x 20 mm (9.2" x 6.3" x 0.8"), 1.03 kg (2.27lb)<br>6U /2 slots width (8HP), 233.35 x 160 x 40 mm (9.2" x 6.3" x 1.6"), 1.42kg (3.14lb) | |
| Environment | | 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 |
| | Vibration | 5 ~ 500Hz, 2Grms (4HP), 1Grms (8HP) | 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 | |
| | 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

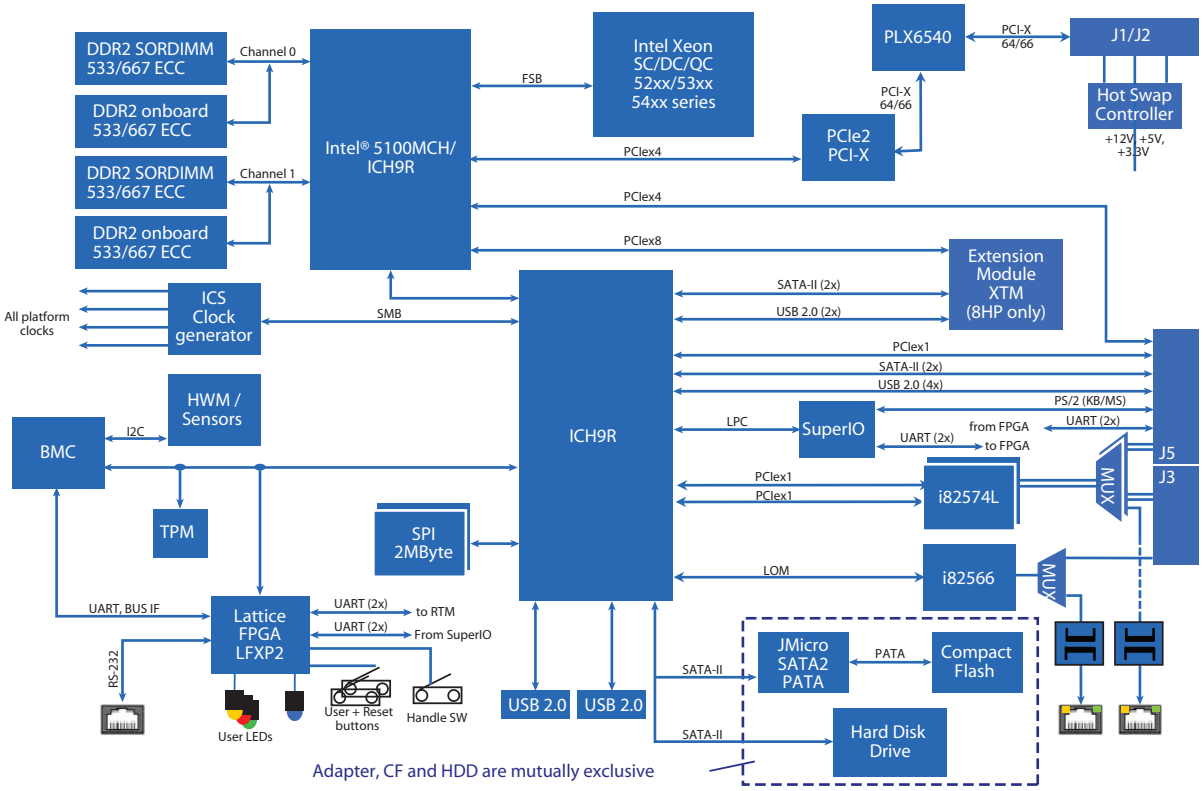
| System Board | Front Panel | | | | | Main On-board Features | | | | Extension Module |
|---|---|---|---|---|---|---|---|---|---|---|
| | LAN | COM | USB | XMC/PMC Knockout | VGA Knockout | Memory | SATA HDD Socket | CF Socket | Slot Width | |
| MIC-3393A-M2E | 2 | 1 | 2 | - | - | 2 GB | 1 | 1 | 1 | - |
| 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

| RTM Model Number | 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 |

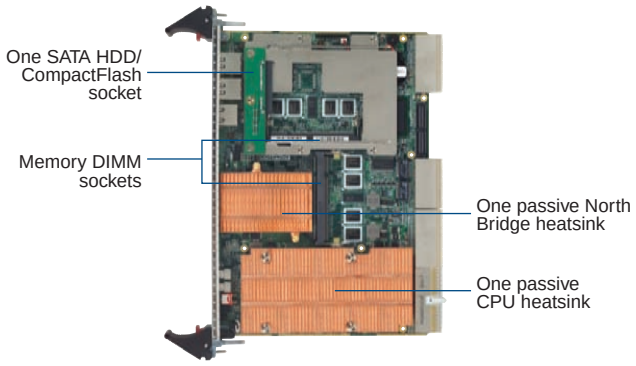
*Note: One PS/2 port carries the signals for both K/B and mouse. Y cable is included.
**Note: Use of Advantech EmbCore USB 2.0 Disk Module (Type C) recommended

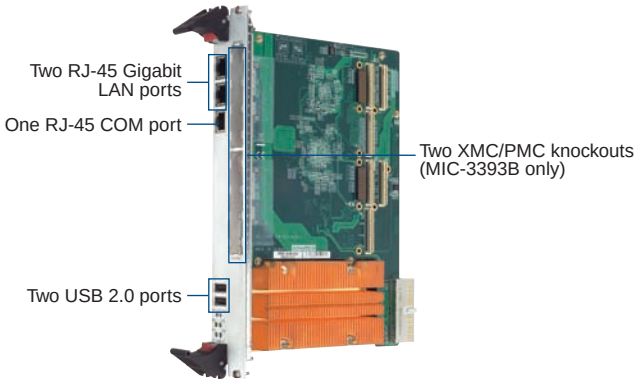
## Board Diagram




## Ordering Information

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

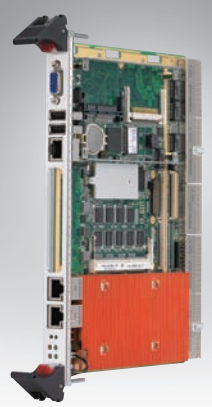


# MIC-3395

## 6U CompactPCI 2nd Generation Intel® Core™ i3/i5/i7 Processor Blade with ECC support

Preliminary



## Features

- Supports 2nd Generation Intel® Core™ i3/i5/i7 processors and Intel® QM67 PCH with embedded graphic (dual independent display)
- Up to 16 GB (DDR3 1066/1333) ECC memory (max 8GB on board, socket SO-UDIMM x1, max 8GB)
- Optimized single-slot SBC with 2.5" SATA-III HDD/CompactFlash socket
- TPM, two SATA ports, four USB 2.0 ports, one DVI/VGA port, 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

CompactPCI® FCC CE RoHS COMPLIANT 2002/95/EC

## Introduction

Using Intel's 2nd generation Core i3/i5/i7 processors based on 32nm process technology supporting up to two Cores / four threads at 2.2GHz and 4MB last level 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 16GB 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 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) offers twice the performance over previous generations. With dual independent display support, the MIC-3395 is an ideal fit for demanding workstation 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, one DVI/VGA port, 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 4-port SAS controller with RAID and failover support.

## Specifications

| | | |
|---|---|---|
| Processor System | CPU | Intel® 2nd Generation Core™ i3/i5/i7 up to 2.2 GHz (4MB L2 cache) |
| | Platform Controller Hub | Intel® QM67 |
| | BIOS | Redundant AMI 8MByte SPI flash |
| CompactPCI Interface | J1 Connector | 32-bit PCI local bus |
| | J2 Connector | 64-bit PCI local bus |
| | J3 Connector | PICMG2.16 + RTM area |
| | J4~J5 Connectors | RTM area |
| XMC/PMC Socket | PCIex8 | Gen2 (5GT/s) |
| | PCI | 64-bit/66 MHz |
| Memory | Technology | DDR3 1066/1333 MHz, dual channel with ECC support |
| | Max. Capacity | Up to 16 GB (8 GB on-board, 8 GB SODIMM) |
| | Socket | SODIMM x1 |
| Graphic | Controller | Intel® embedded graphic controller HD3000 (dual independent display) |
| | VRAM | Dynamic |
| | Resolution | Up to 2048 x 1536, 64k colors at 75Hz |
| Ethernet | Controller | 5 Intel® 82574L single-port Gigabit Ethernet controllers (on PCIe x1 channel) |
| | Interface | 10/100/1000Base-TX 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 | 10/100/1000Base-TX Ethernet |
| | I/O Connector | RJ-45 (front panel) |
| Storage | Mode | SATA-III |
| | Channels | Onboard SATA-III connector |
| | Mode | SATA-II |
| | Channels | 2 channels to RTM<br>1 channel to CFast socket |
| | Mode | SATA-II to IDE |
| | Channels | 1 channel to CompactFlash socket |





Last updated : 9-Feb-2011

| | | | |
|---|---|---|---|
| Front I/O | USB2.0 | 2 type A | |
| | COM | 1 RS232 on RJ45 | |
| | LAN | 2 10/100/1000 Mbps on RJ45 | |
| | 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 | |
| Rear I/O | USB2.0 | 4 ports | |
| | COM | 2 ports | |
| | LAN | 2 ports | |
| | SATA | 2 SATA-II | |
| | PCIe | 1 PCIex4 | |
| | Others | PS/2 for keyboard & mouse, DVI/VGA | |
| Watchdog Timer | Output | Local Rest and Interrupt | |
| | Interval | Programmable 1s ~ 255s | |
| Hardware Monitor | HWM | NCT6776F | |
| BMC | Controller | Renesas H8S 2167, IPMI v2.0 compliant | |
| Operating System | Compatibility | Windows® XP/2000, Linux, VxWorks 6.4 (on request) | |
| Power Requirement | Configuration | 4 GB memory onboard | |
| | TDP (estimated) | 52 W | |
| Physical | Dimension | 160.0 x 233.35 mm | |
| Environment | | 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 |
| | 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 |
| Regulatory | Conformance | FCC Class A, CE, RoHS | |
| | 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, PICMG2.16 R1.0, | |

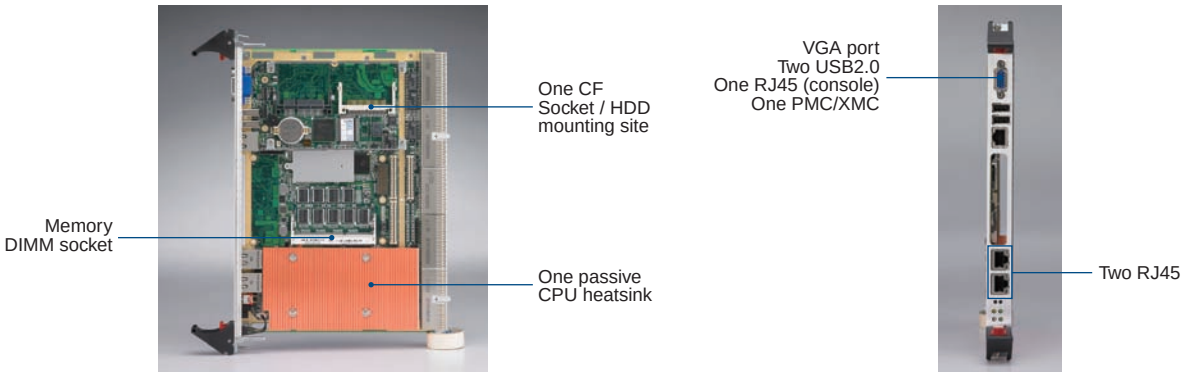
## Ordering Information

| System Board Model Number | Front Panel | | | | Main On-board Features | | | |
|---|---|---|---|---|---|---|---|---|
| | VGA | USB2.0 (type A) | Ethernet (RJ45) | Console (RJ45) | Onboard Memory | CF Socket | Storage Channel | SODIMM Socket |
| MIC-3395A1-M4E | 1 | 2 | 2 | 1 | 4GB | 1 | 1 SATA-III | 1 |
| MIC-3395A2-M4E | 0 | 2 | 2 | 1 | 4GB | 1 | 1 SATA-III | 1 |

## Related Products

| Model number | Configuration |
|---|---|
| RIO-3315-A1E | RTM Module 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 interfaces |

**MIC-3395x-MxE Series**



# MIC-3666

## Dual 10 Gigabit Ethernet XMC

## 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

RoHS COMPLIANT 2002/95/EC

## 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® 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'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

| | | | |
|---|---|---|---|
| XMC Connectivity | Connector | P15 assembled, | |
| | Host interface | PCIex8 gen.2 @ 5Gbps/lane | |
| Controller | Controller | Intel® 82599ES dual 10GbE MAC/PHY | |
| | Virtualization technologies | VMDq, VMD, SR-IOV | |
| | IP | IPv4, IPv6 | |
| | Queues | 128RX, 128TX per port | |
| | Offloading | TCP, UDP, SCTP, FCoE | |
| | Security acceleration | Linksec IEEE802.1ae (AES-128 Authorization./Encryption)<br>IPSec (AES-128, 1024 SA's) | |
| IO | SFP+ | 2 sites with support for presence detect, status and ID EEPROM | |
| | LEDs | Network Link, Activity | |
| Software | Linux | X86 Kernel 2.6.x | |
| | Windows | Server2003, Server2008 | |
| | Boot | PXE, iSCSI | |
| Power | Power Consumption | +3.3V | VPWR (+5V) |
| | Does not include FOT transceivers | 0.25A max | 1.5A max |
| Environment | | Operating | Non-Operating |
| | 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 mm x 149 mm (2.9" x 5.78") | |
| | Weight | 0.104 kg (0.23 lbs) | |
| Compliance | IEEE Std 1386.1-2001 PMC specification<br>VITA 42.0-2005, 42.3-2006 XMC specifications | | |

## Recommended Configurations

| XMC Extension Board | CPU Board |
|---|---|
| MIC-3312-A1E | MIC-3393B-M2E |

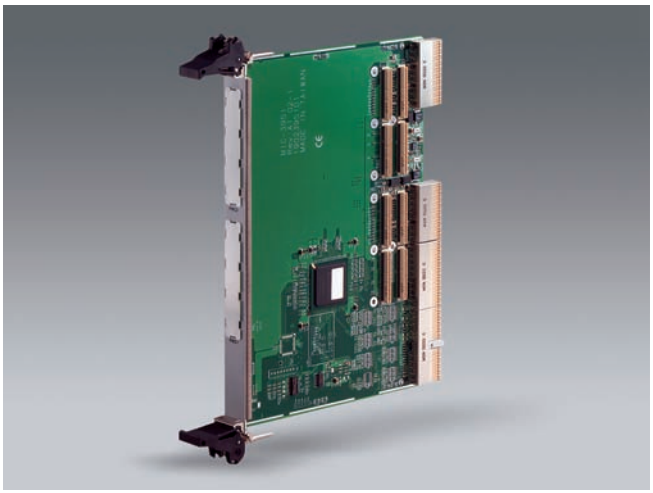

MIC-3666-AE

## Ordering Information

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

# MIC-3951

## 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

RoHS COMPLIANT 2002/95/EC

## 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® 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

| | | | |
|---|---|---|---|
| Bus | PCI | From 32-bit/33 MHz up to 64-bit/66 MHz | |
| | PCI-to-PCI Bridge | Intel® 21154 | |
| Power | Power Consumption | 2.2 W @ 64 bit/66 MHz (670 mA @ +3.3 V) | |
| Environment | | Operating | Non-Operating |
| | Temperature | 0 ~ 60 °C (32 ~ 140 °F) | -20 ~ 80 °C (-4 ~ 176 °F) |
| | 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 | |
| | Weight | 0.5 Kg (1.10 lb) | |
| Reliability | Mean-Time-To-Repair (MTTR) | 5 minutes | |
| Compliance | PICMG 2.0 R3.0 CompactPCI Specification<br>PICMG 2.3 R1.0 CompactPCI PMC I/O Mapping Specification<br>IEEE P1386.1 R2.3 PMC Specification | | |

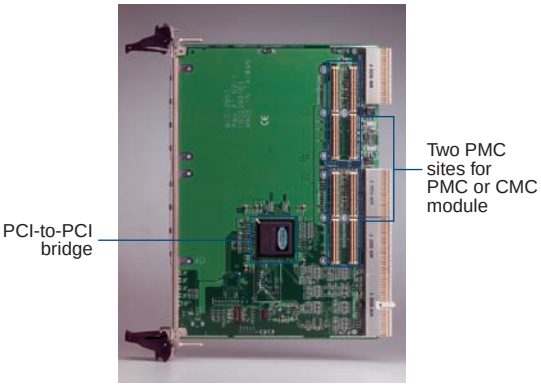
## Recommended Configurations

| PMC Carrier Board | PMC Module |
|---|---|
| MIC-3951 | MIC-3665-AE<br>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



# MIC-3960

## 6U CompactPCI® Media Carrier Board

## Features

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

FCC CE RoHS COMPLIANT 2002/95/EC

## 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

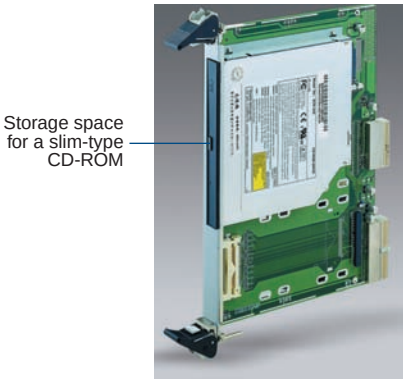
| | | | |
|---|---|---|---|
| Storage Space | Slim CD-ROM | 1 | |
| Power | Power Consumption | 1 W | |
| Environment | | Operating | Non-Operating |
| | Temperature | 0 ~ 60° C (32 ~ 122° F) | -40 ~ 60° C (-40 ~ 140° F) |
| | Humidity | - | 95 % @ 60 °C, non-condensing |
| | Vibration (5 ~ 500 Hz) | 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 | |
| | Weight | 0.5 kg (1.10 lb) | |
| Reliability | Mean-Time-To-Repair (MTTR) | 5 minutes | |
| Compliance | PICMG 2.0 R3.0 CompactPCI Specification | | |

## 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 |

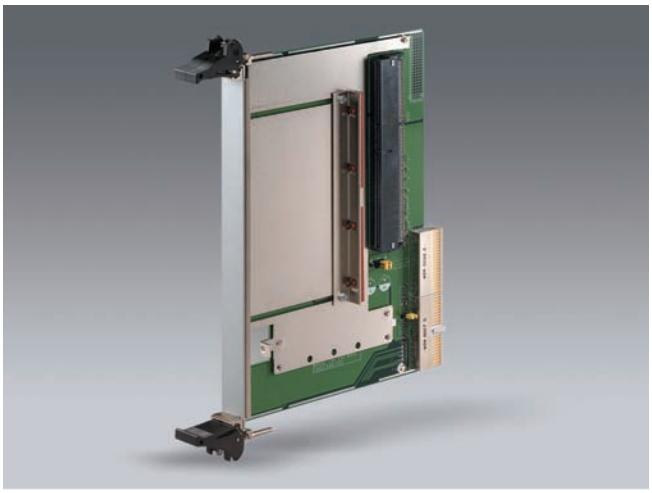
## Ordering Information

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



# MIC-3961

## 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

RoHS COMPLIANT 2002/95/EC

## Introduction

The MIC-3961 is a 6U CompactPCI® 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 | |
| Environment | | Operating | Non-Operating |
| | Temperature | 0 ~ 60° C (32 ~ 140° F) | -20 ~ 80° C (-4 ~ 176° F) |
| | 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 | |
| | Weight | 0.6 kg (1.32 lb) | |
| Reliability | Mean-Time-To-Repair (MTTR) | 5 minutes | |
| Compliance | PICMG 2.0 R3.0 CompactPCI Specification | | |

## Recommended Configurations

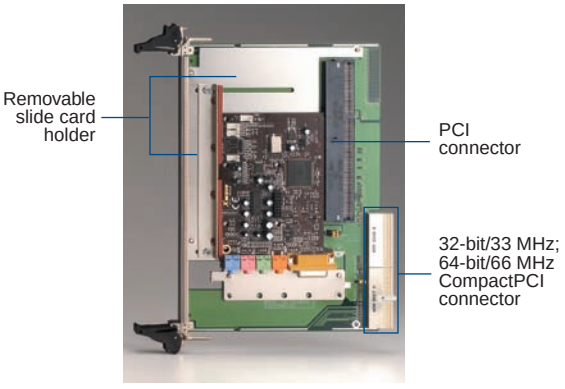
| PCI Carrier Board | Enclosure |
|---|---|
| MIC-3961-AE | MIC-3042, MIC-3043 series |

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

## Ordering Information

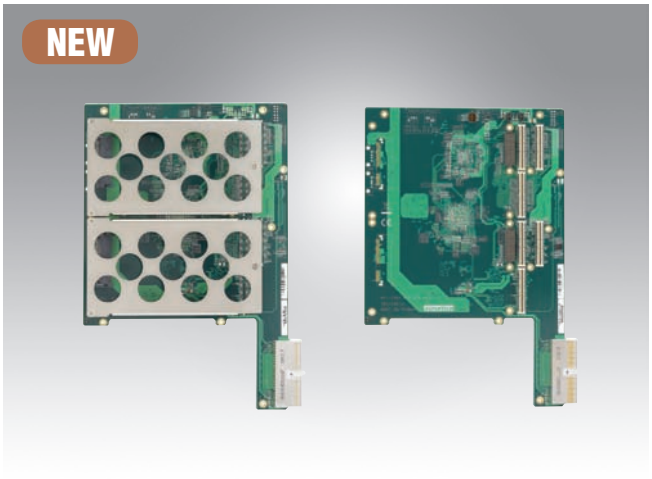
| Part Number | Description |
|---|---|
| MIC-3961-AE | 6U CompactPCI PCI carrier board |

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



# MIC-3312

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




## Features

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

CompactPCI® FCC CE RoHS

## 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 | |
| Power Consumption | MIC-3312-A1E | +3.3V | - |
| | (without XMC/PMC) | 1.5A | - |
| | MIC-3312-A2E | - | +5V |
| | (with SATA HDD*2) | - | 2A |
| Environment | | 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 |
| Physical Characteristics | Dimensions (W x D) | 233.35 mm x 160 mm (9.2" x 6.3"), 2-slot width (MIC-3393 + MIC-3312) | |
| | Weight | 0.2 kg (0.44 lbs) (MIC-3312) | |

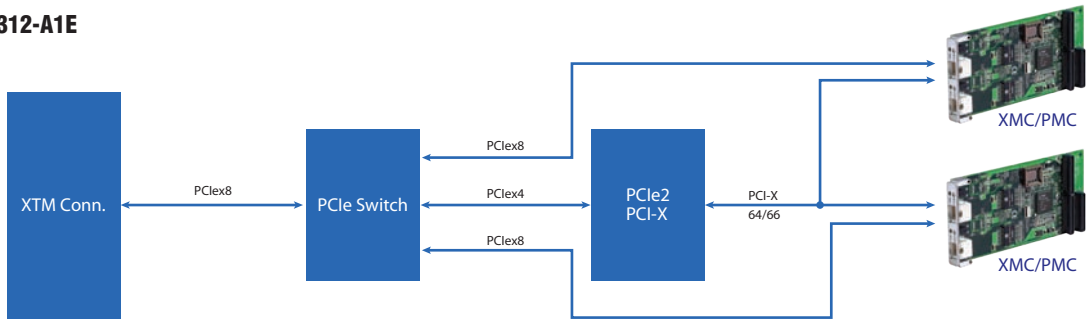




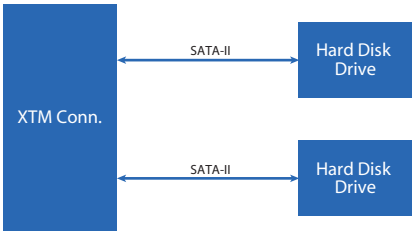
Last updated : 9-Feb-2011

## Board Diagram

**MIC-3312-A1E**




**MIC-3312-A2E**

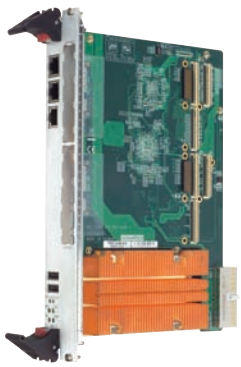



## Recommended Configurations

| Extension Module | CPU Board |
|---|---|
| MIC-3312-A1E | MIC-3393B-M2E |
| MIC-3312-A2E | MIC-3393C-M2E |

## Ordering Information

| XTM Model Number | On-board Header/Socket/Connector | |
|---|---|---|
| | XMC/PMC | SATA HDD |
| MIC-3312-A1E | 2 | - |
| MIC-3312-A2E | - | 2 |

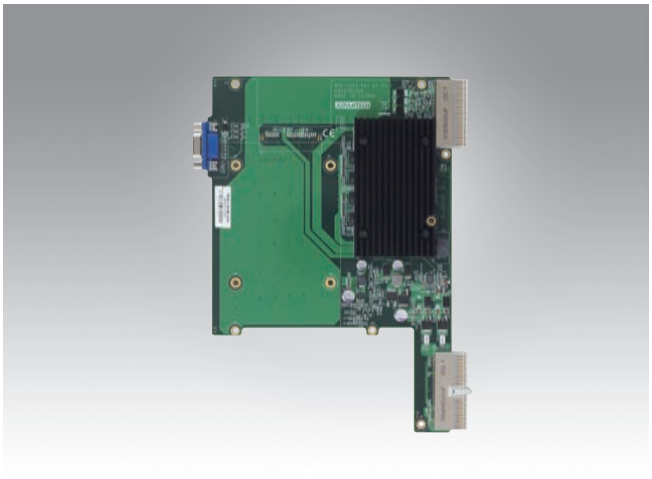


**MIC-3312-A1E**

**MIC-3312-A2E**

# MIC-3313

## 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

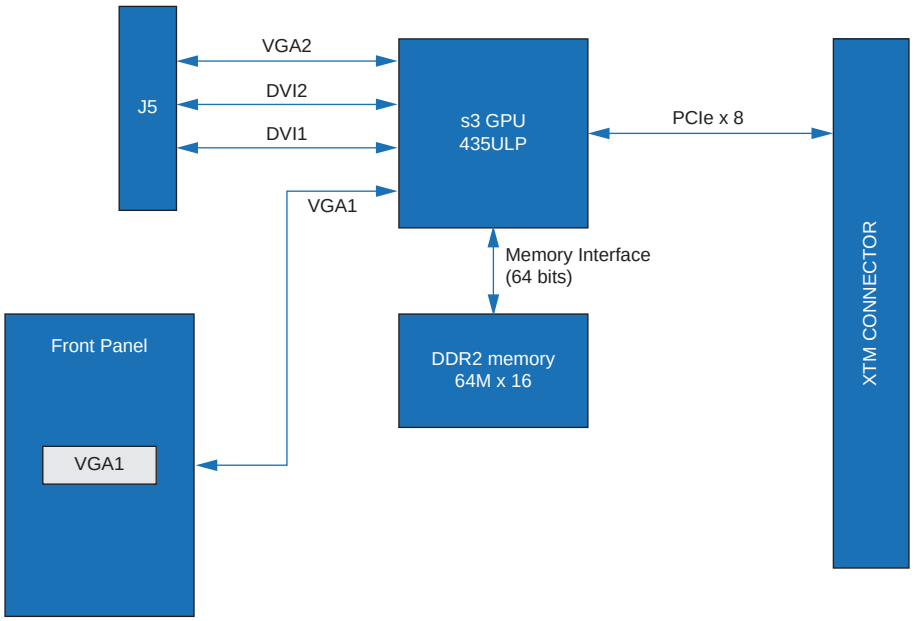
## Introduction

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 solution. Using on-board S3 435ULP low power GPU and 256MB DDR2 memory on MIC-3313 can support high performance display solution for MIC-3393. If further combine 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 | |
| Power Consumption | MIC-3313-A1E | +3.3 V | +5 V |
| | | 0.21 A | 1.89 A |
| Environment | | Operating | Non-Operating |
| | 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 mm x 160 mm (9.2" x 6.3"), 2-slot width (MIC-3393 + MIC-3313) | |
| | Weight | 0.2 kg (0.44 lbs) (MIC-3313) | |

## Board Diagram

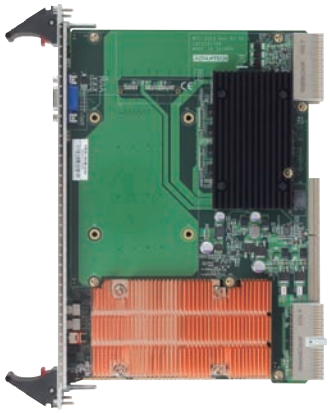


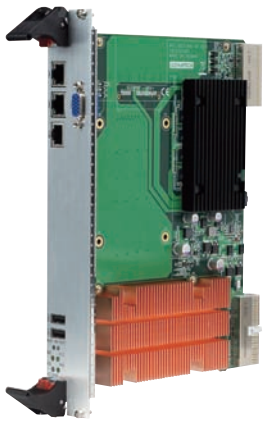

## Recommended Configurations

| Extension Module | CPU Board | Enclosure |
|---|---|---|
| MIC-3313-A1E | MIC-3393D Series | MIC-3042, MIC-3043 Series |

## Ordering Information

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





# MIC-3927

## CompactPCI® Intel®ligent Chassis Management Module (PICMG® 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

CE RoHS COMPLIANT 2002/95/EC

## 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-3390 and MIC-3392

## Sensor Specifications

| | | |
|---|---|---|
| Voltage | Input | +3.3 $V_{DC}$, +5 $V_{DC}$, -5 $V_{DC}$, +5 $V_{SB}$, +12 $V_{DC}$, -12 $V_{DC}$, VBat |
| Temperature | Input | 1 (onboard) |
| | Sensor | Thermistor |
| | Interface | I2C |
| | Range | -40 ~ 120° C (-40 ~ 248° F) |
| Fan Speed | Input | 9 |
| | Range | 700 ~ 10000 rpm |
| Power Good | Input | 4 |
| | Range | High > 2.4 $V_{DC}$, Low < 0.8 $V_{DC}$ |
| CPU Board Health | Interface | I2C |
| | 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 |

## Hardware Specifications

| | | | |
|---|---|---|---|
| Processor System | CPU | RDC2880 | |
| | Firmware | 2 MB Embedded Flash ROM | |
| | Memory | 2 MB SRAM | |
| Ethernet | Interface | 10/100 Mbps | |
| Serial Port | Interface | RS-232 | |
| | Baud Rate | 9600 bps | |
| Miscellaneous | Buzzer support | Yes | |
| | Time-out Signal for watchdog timer detection | Yes | |
| Battery | Charge Time | 24 hr | |
| | Battery Type | Ni-MH | |
| | Capacity | 1500 mA-H (full charged, for 15~20 minutes operation, 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 | |
| Environment | | Operating | Non-Operating |
| | 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")<br>Carrier module: 100 x 95 mm (3.9" x 3.7") | |

## Ordering Information

| Part Number | Description |
|---|---|
| MIC-3927AE | MIC-3927 alarm module for MIC-3056, MIC-3081 |
| MIC-3927BE | MIC-3927 alarm module for MIC-3038, MIC-3041 |
| MIC-3927CE | MIC-3927 alarm module for MIC-3042, MIC-3043 |

## Firmware Specifications

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


RS-232 COM port LAN port

Onboard Battery

# RIO-3310

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

## 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.

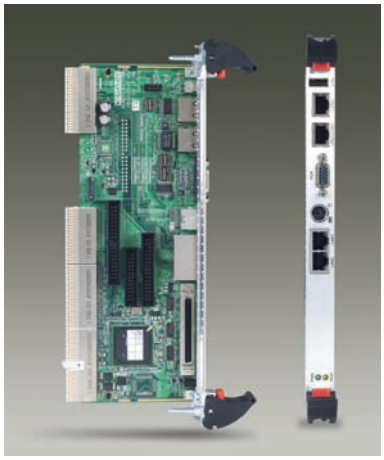
## Features

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

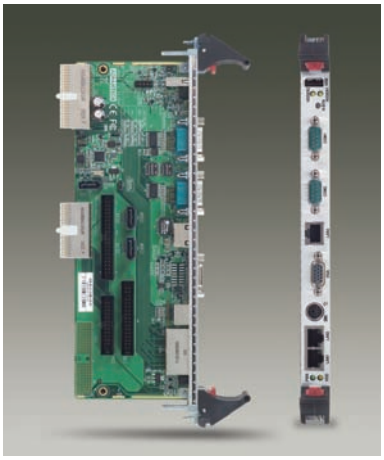
CompactPCI®

## 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 |
| | | 3 A | 2 A | 1 A |
| Environment | | Operating | | Non-Operating |
| | 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 1.5"), 1-slot width | | |
| | Weight | 0.4 kg (0.88 lb) | | |



RIO-3310S-A1E



RIO-3310BE

## I/O Interfaces

| I/O | Connector | | | Interface Location | | |
|---|---|---|---|---|---|---|
| | 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

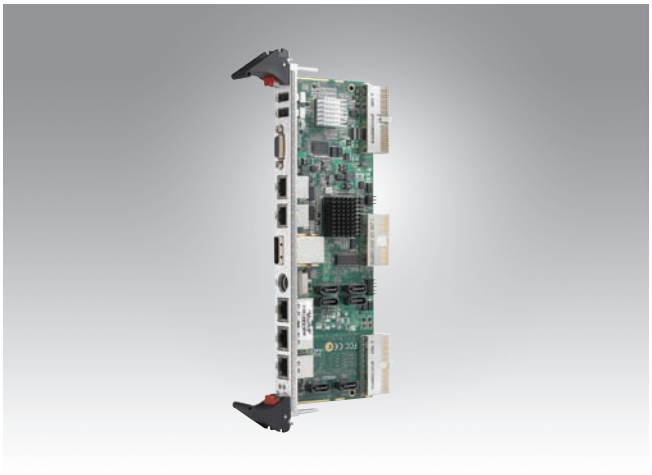
| Part Number | Rear Panel | | | | | | | On-board Header | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Keyboard | Mouse | COM | USB | LAN | VGA | SCSI | USB | SCSI | IDE 40-pin | FDD | Parallel | SATA |
| RIO-3310S-A1E | 1* | 1* | 2 | 1 | 2 (GbE) | 1 | - | 1 | 1 | 1 | 1 | 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)<br>1 (10/100) | 1 | - | 1 | - | 1 | 1 | 1 | 3** |

* Y cable is included.

** Among three SATA connectors, two are used for RAID function.

# RIO-3311

## 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
- 1 USB header for USB NAND Flash Module
- 3 RJ-45 GbE ports on the rear panel
- 1 VGA port on the rear panel
- 1 Mini-SAS port on the rear panel

CompactPCI® FCC CE RoHS

## 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 SAS / SATA data transfer and RAID | |
| Graphics | Controller | XGI Volari Z11 | |
| | VRAM | 32 MB | |
| | Resolution | Up to 1600 x 1200, 64 K hi-color at 70 Hz | |
| Power | Power Consumption | +3.3 V | +5 V |
| | | 1.5 A | 1.5 A |
| Environment | | 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 |
| Physical Characteristics | Dimensions (W x D) | 233.35 mm x 80 mm (9.2" x 1.5"), 1-slot width | |
| | Weight | 0.3 kg (0.66 lbs) | |

## Recommended Configurations

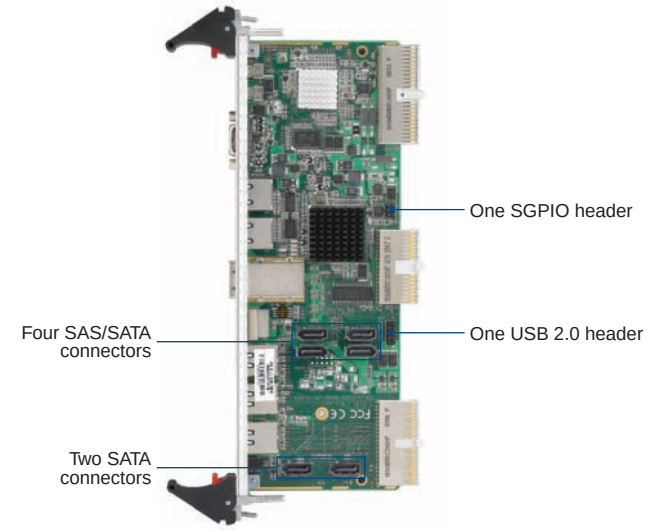
| Rear I/O Board | CPU Board |
|---|---|
| RIO-3311-A1E, RIO-3311-A2E | MIC-3393A, MIC-3393B, MIC-3393C Series |

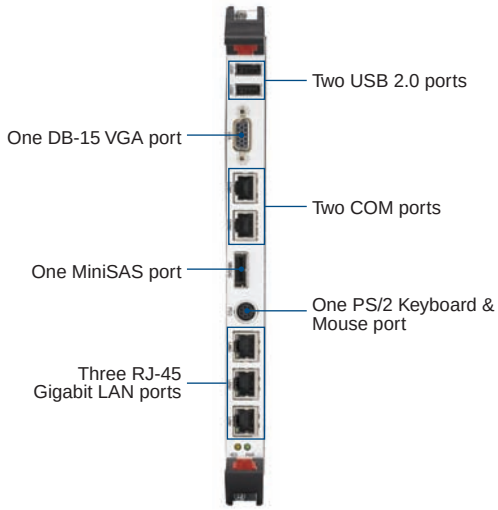
## Ordering Information

| RTM Model Number | Rear Panel | | | | | | On-board Header/Socket/Connector | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 |

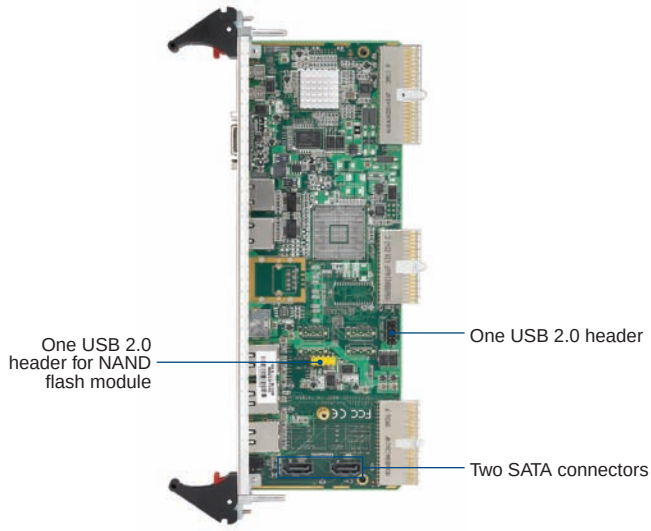
*Note: One PS/2 port carries the signals for both K/B and mouse. Y cable is included.
**Note: Use of Advantech EmbCore USB 2.0 Disk Module (Type C) recommended

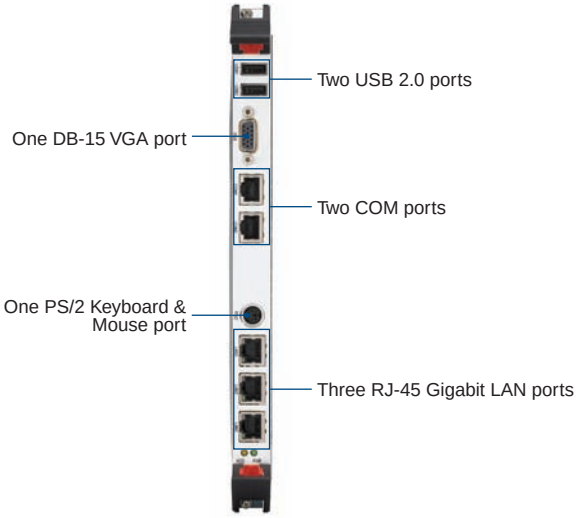
## RIO-3311-A1E




## RIO-3311-A2E



# RIO-3313

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

## Features

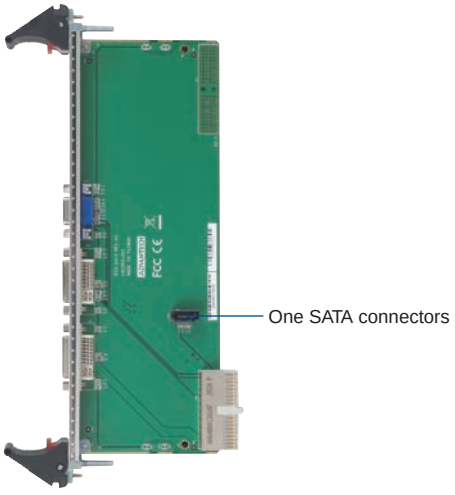
- External rear-panel interface connectors for the MIC-3313 XTM board
- Supports VGA, DVI-D interfaces
- 1 SATA connector

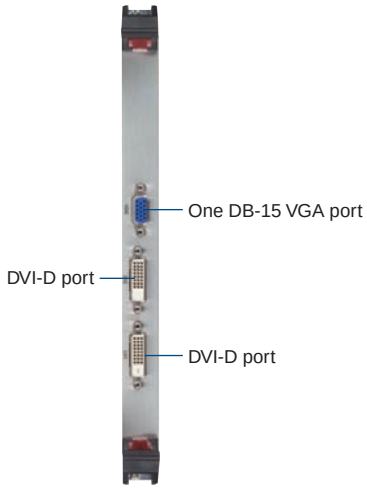
## Introduction

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.

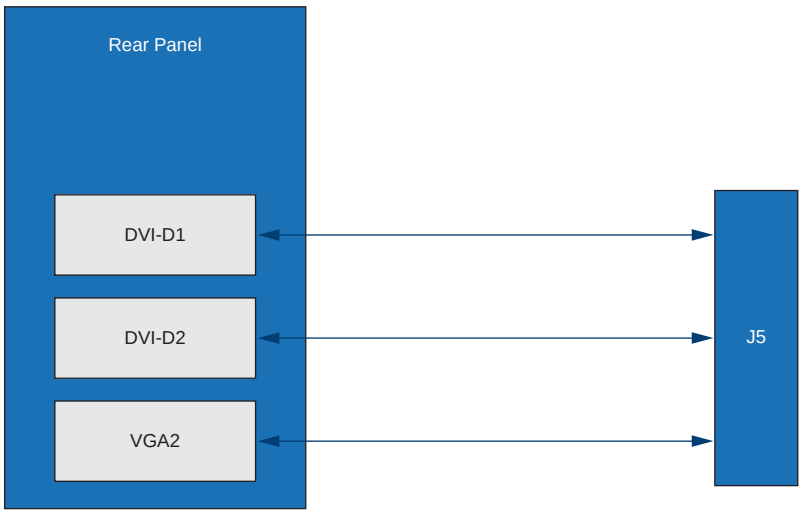
## Specifications

| | | | |
|---|---|---|---|
| CompactPCI Connector | J5 | | |
| Graphic | Interface | VGA2, DVI1, and DVI2 | |
| Environment | | Operating | Non-Operating |
| | 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 mm x 80 mm (9.2" x 1.5"), 1-slot width | |
| | Weight | 0.3 kg (0.66 lbs) | |



## Board Diagram




## Recommended Configurations

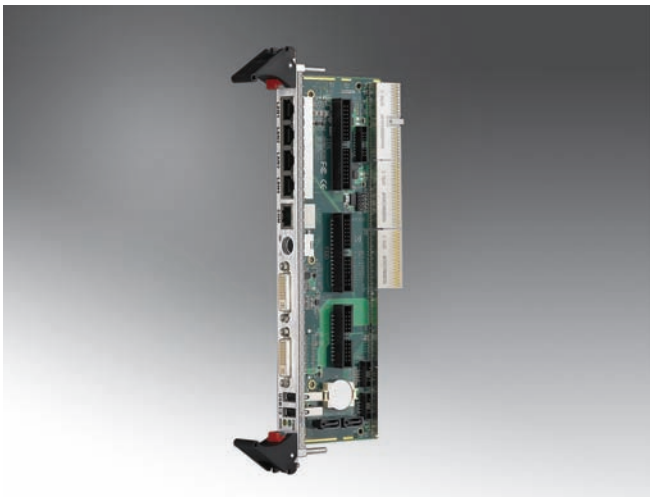
| Rear I/O Board | CPU Board | Enclosure |
|---|---|---|
| RIO-3313-A1E | MIC-3393D Series | MIC-3042, MIC-3043 Series |

## Ordering Information

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

# 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
- 4 RJ-45 ports on the rear-panel
- 2 DVI-I ports on the rear panel

CompactPCI® FCC CE RoHS COMPLIANT 2002/95/EC

## 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

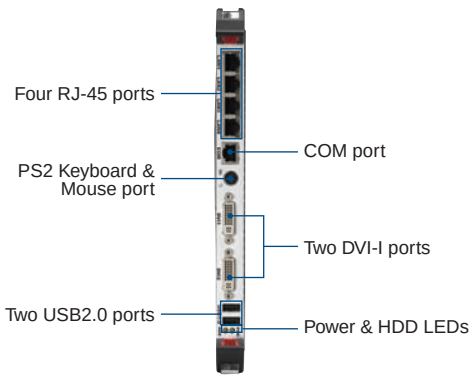
| | | | |
|---|---|---|---|
| CompactPCI Connector | J3/J4/J5 | | |
| Environment | | Operating | Non-Operating |
| | Temperature | -40 ~ 70° C (-40 ~ 158° F) | -50 ~ 80° C (-58 ~ 176° F) |
| | Humidity | 5 ~ 85 % @ 45° C, non-condensing | 10 ~ 95 % @ 45° C, non-condensing |
| Physical Characteristics | Dimensions (W x D) | 233.35 mm x 80 mm (9.2" x 1.5"), 1-slot width | |
| | Weight | 0.305 kg (0.672 lbs) | |

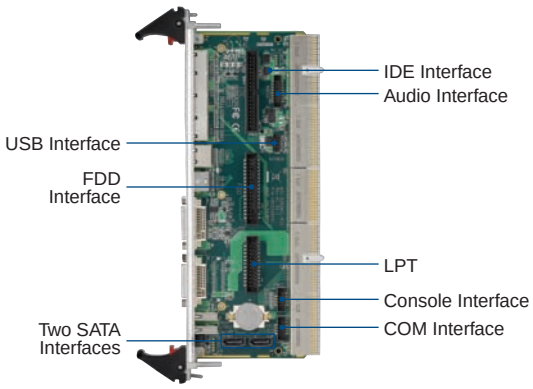
## Recommended Configurations

| 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

| RTM Model Number | Rear Panel | | | | | On-board Header/Socket/Connector | | | | | | | CPCI Conn. | Conformal Coating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAN | COM | DVI-I | PS2 | USB | IDE | FDD | LPT | SATA | COM Interface | Console Interface | USB Interface | | |
| 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 or PICMG 2.16)


## Features

- 8-slot 6U CompactPCI® 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
- Built-in alarm module (MIC-3924L-AE)

## 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.

## Specifications

| | | MIC-3042A | | MIC-3042B | |
|---|---|---|---|---|---|
| Backplane | 6U slot | System x 1, Peripheral x 6, Switch x 1, Rear transition x 8 (80 mm, IEEE1101.11 compliant) | | System x 1, Peripheral x 6, Media x 1, Rear transition x 7 (80 mm, IEEE1101.11 compliant) | |
| | Blade Server Support | Yes | | - | |
| | Bus | Up to 64-bit/66 MHz PCI bus | | | |
| | H.110 CT Bus | Yes | | Yes | |
| | V (I/O) | +3.3 V/+5 V (selectable) | | | |
| Cooling | Fan | 2 (front: 193 CFM, rear: 61.3 CFM) | | | |
| Power Supply | Input | AC 100 ~ 254 V @ 50 ~ 60 Hz, full range (MIC-3042X-A) | | | |
| | Output | AC cPCI 250 W redundant power module | | | |
| | | +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 |
| Environment | | Operating | | Non-Operating | |
| | Temperature | 0 ~ 45° C (32 ~ 113° F) | | -20 ~ 60° C (-4 ~ 140° F) | |
| | 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 | |
| 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) | | | |
| Reliability | MTBF | Backplane | Fan module | Power supply | |
| | | 800,000 hours | 50,000 hours @ 25 °C | 100,000 hours @ 70% load | |
| Serviceability | MTTR | 5 minutes | | | |
| Compliance | PICMG 2.0 R3.0 CompactPCI Specification<br>PICMG 2.1 R2.0 CompactPCI Hot Swap Specification<br>PICMG 2.5 R1.0 CompactPCI Computer Telephony Specification<br>PICMG 2.11 R3.0 Front-Access Power Connectors Specification<br>PICMG 2.16 R1.0 CompactPCI Packet Switching Backplane Specification (MIC-3042B is not compliant with PICMG 2.16) | | | | |
| | RoHS, CE, FCC, UL, CCC | | | | |



Last updated : 9-Feb-2011

## 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 |

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

| 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 |

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

## Recommended Configurations

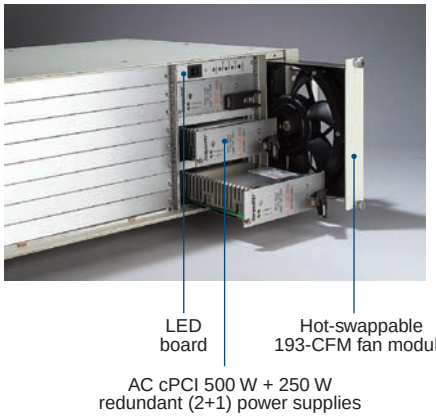
| Enclosure | CPU Board | Rear I/O Board | Chassis Management Module |
|---|---|---|---|
| MIC-3042AE<br>MIC-3042A-AE | MIC-3390E, MIC-3390-AE,<br>MIC-3392A-MxE, MIC-3392B-MxE,<br>MIC-3392A2-MxE, MIC-3392B2-MxE,<br>MIC-3392LE | RIO-3310S-A2E, RIO-3310BE | Included MIC-3924L-AE or Optional MIC-3927CE |
| MIC-3042BE<br>MIC-3042B-AE | MIC-3390E, MIC-3390-AE,<br>MIC-3392A-MxE, MIC-3392B-MxE,<br>MIC-3392A2-MxE, MIC-3392B2-MxE,<br>MIC-3392LE | RIO-3310S-A2E, RIO-3310BE | |

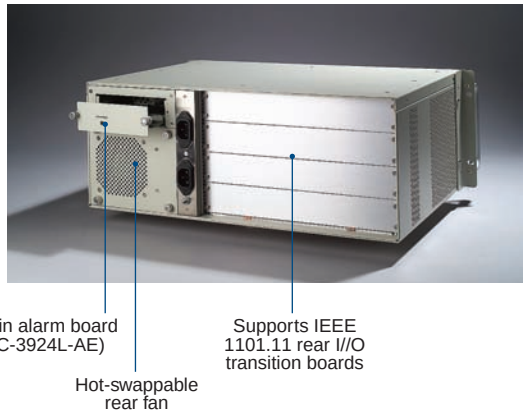
## Ordering Information

| 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) |

## Accessories

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



# MIC-3043

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

## Features

- 6-slot 6U CompactPCI® backplane
- Supports two hot-swappable SATA or HDD bays
- Built-in IDE slim-type CD-ROM
- AC cPCI 250 W + 250 W redundant (1+1) power supplies
- Supports hot-swappable fan modules
- PICMG 2.5 (CompactPCI Computer Telephony) compliance
- 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 IEEE 1101.11 rear I/O transition boards. Users can route I/O signals to the rear transition boards for simplified system cabling. Front boards pop in and out without any hardwiring. The MIC-3043 has two hot-swappable SATA HDD bays and one slim CD-ROM as standard.

The MIC-3043 has a high-quality backplane that supports impedance control and 64-bit / 66 MHz cards for full compatibility. The H.110 CT Bus complies with PICMG 2.5, which is an open architecture ideal for telecom solutions or development platforms.

## Specifications

| | | MIC-3043D | MIC-3043E |
|---|---|---|---|
| Backplane | 6U Slot | System x 1, Peripheral x 5, Rear transition x 6 (80 mm, IEEE1101.11 compliant) | |
| | H.110 CT Bus | Yes | - |
| | Bus | 32-bit/33 MHz, 64-bit/66 MHz | |
| | V (I/O) | +3.3 V/+5 V (selectable) | |
| Cooling | Fan | 2 (front: 193 CFM, rear: 61.3 CFM) | |
| Drive Bay | 3.5" HDD | 2 (SATA) | 2 (SATA) |
| | Slim CD-ROM | 1 | 1 |
| Management Interface | Alarm Indicators | 2 (fan failure and system overheating) | |
| Power Supply | Input | AC 100 ~ 240 V @ 50 ~ 60 Hz, full range (MIC-3043X-XX) | |
| | Output | AC cPCI 250 W redundant power module | |
| | | -12 V | |
| | Max. Load | 1 A | |
| | Min. Load | 0 A | |
| Reliability | MTBF | Backplane | Power supply |
| | | 800,000 hours | 100,000 hours @ 70% |
| Environment | | Operating | Non-Operating |
| | Temperature | 0 ~ 45° C, (32 ~ 113° F) | -20 ~ 60° C, (-4 ~ 140° F) |
| | 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 ) | |
| Compliance | PICMG 2.0 R3.0 CompactPCI Specification<br>PICMG 2.1 R2.0 CompactPCI Hot Swap Specification<br>PICMG 2.11 R3.0 Front-Access Power Connectors Specification<br>PICMG 2.5 R1.0 CompactPCI Computer Telephony Specification (MIC-3043E is not compliant with PICMG 2.5) | | |
| | RoHS, CE, FCC, UL, CCC | | |

* Without SCSI/IDE/SATA HDD

## 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)

## Recommended Configurations

| Enclosure | CPU Board | Rear I/O Board | Chassis Management Module | |
|---|---|---|---|---|
| | | | Included | Optional |
| MIC-3043DE<br>MIC-3043D-BE | MIC-3390E, MIC-3390-AE, MIC-3392A-MxE, MIC-3392B-MxE, MIC-3392A2-MxE, 3392B2-MxE, MIC-3392LE | RIO-3310S-A1E, RIO-3310S-A2E, RIO-3310AE, RIO-3310BE | MIC-3924L-AE | MIC-3927CE |
| MIC-3043EE<br>MIC-3043E-BE | MIC-3390E, MIC-3390-AE, MIC-3392A-MxE, MIC-3392B-MxE, MIC-3392A2-MxE, 3392B2-MxE, MIC-3392LE | RIO-3310AE, RIO-3310S-A2E, RIO-3310S-A1E, RIO-3310BE | | |

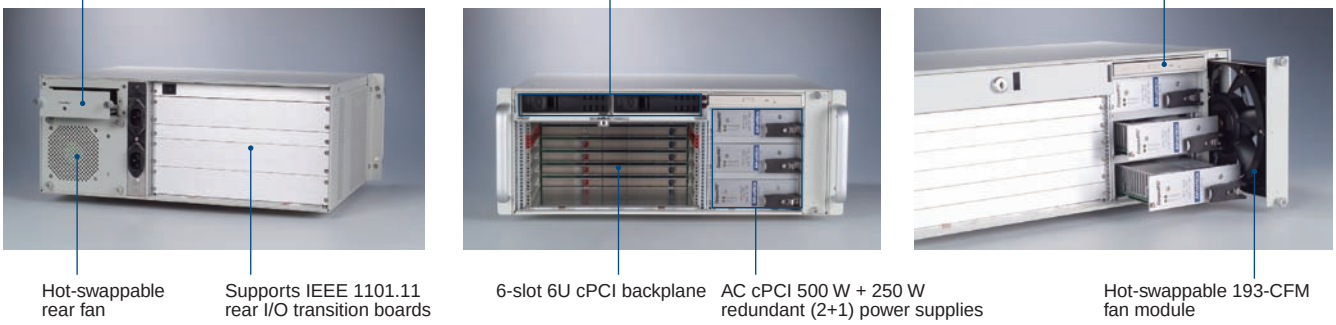
## Ordering Information

| Part Number | PICMG 2.5 | HDD Bay | Media Support | Chassis Management Module | cPCI Power Supply |
|---|---|---|---|---|---|
| MIC-3043DE | Yes | SATA | Slim CD-ROM | MIC-3924L-AE | - |
| MIC-3043D-BE | Yes | SATA | Slim CD-ROM | MIC-3924L-AE | Hot-swap AC cPCI 250 W + 250 W |
| MIC-3043EE | - | SATA | Slim CD-ROM | MIC-3924L-AE | - |
| MIC-3043E-BE | - | SATA | Slim CD-ROM | 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.

## Accessories

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



# NCP-3120

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


## Features

- Entry level of Advantech Packetarium™ based Network Appliance
- FRU-designed I/O tray, support different external Ethernet I/O
- Support up to eight SATA 2 SSDs
- One Standard PCIe Expansion

## Introduction

The NCP-3120 represents the entry level of Advantech Packetarium™ Network Appliance. It integrates powerful and multi-Core Packetarium™ Network Processing Boards for wire speed packet processing. The main carrier board provides eight SATA controllers, eight lanes PCI Express Gen2 expansion slot, and two I/O slot for FRU-designed I/O board usage. FRU-designed I/O board could provide more flexibility external I/O configuration. Each I/O slot could 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.

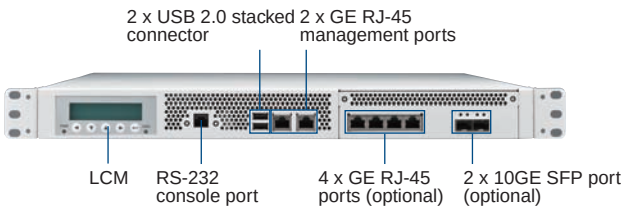
## Main Carrier Board Specification

| | | |
|---|---|---|
| Processor | | Depends on Packetarium™ Board |
| Memory | | Depends on Packetarium™ Board |
| Network Interface | I/O Board Information | 4 x GE RJ-45 with Hardware Bypass<br>2 x 10GE SFP+ |
| | Management Port | Up to 2 x GE RJ-45 |
| HW Management | Controller | Winbond W83793G |
| Storage System | Controller | 8x Silicon Image Sil3132 |
| | Storage Interface | Up to 8 x 2.5" SATA 2 SSDs |
| I/O Interface | Serial Port | 1 x RJ-45 type console port |
| Expansion | Type | 1 x PCI Express x8 slot |
| Power | Type/Watt | AC: 275W / DC: 275W |
| | Input | AC: 100~240VAC / DC: -36 ~ 72VDC |
| Cooling | FAN | 3 x fans |
| Environment | Operation | 0 to 40 oC , 20% to 90% RH |
| | Storage | -20 to 70 oC, 5% to 95% RH |
| Compliance | EMC/Safety | CE/FCC/UL/CB/CCC |

## Packetarium™ Board Specification

| | |
|---|---|
| Packetarium™ Board<br>NCPB-2310<br>Cavium Octeon Plus | Cavium OCTEON PLUS CN5650-NSP-800 Mhz<br>4 x DDR2 DIMMs up to 8 GB<br>2 x 64 MB boot flash<br>2 x PCIex4<br>2 x XAUI |

## Conceptual Fornt Panel




## Ordering Information

| Part Number | Description |
|---|---|
| NCP-3120-C3A0AE | NCP-3120 with NCPB-2310, 8x CE RJ-45 with HW bypass, Single AC PSU |
| NCP-3120-C3D0AE | NCP-3120 with NCPB-2310, 8x CE RJ-45 with HW bypass, Single DC PSU |
| NCP-3120-X3A0AE | NCP-3120 with NCPB-2310, 2x 10G SFP+ without module, Single AC PSU |
| NCP-3120-X3D0AE | NCP-3120 with NCPB-2310, 2x 10G SFP+ without module, Single DC PSU |
| NCP-3120-C3D0BE | NCP-3120 with NCPB-2310, 8x CE RJ-45 with HW bypass, Redundant DC PSU |
| NCP-3120-C3A0BE | NCP-3120 with NCPB-2310, 8x CE RJ-45 with HW bypass, Redundant AC PSU |
| NCP-3120-X3A0BE | NCP-3120 with NCPB-2310, 2x 10G SFP+ without module, Redundant AC PSU |
| NCP-3120-X3D0BE | NCP-3120 with NCPB-2310, 2x 10G SFP+ without module, Redundant DC PSU |





Last updated : 9-Feb-2011

# NCP-5260

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


## Features

- Packetarium™ Board module design.
- Hybrid design for Intel® IA architecture as control plane, and Packetarium Board as data plane
- Hybrid design to lower risk and shorter development schedule for SW
- 1 to 2 Packetarium™ Board slots support
- Dual Intel® Xeon 5500 series support
- 16 x 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® architecture processing on the control plane, and Packetarium™ network processing boards for the data plane. It integrates up to two powerful, multi-Core Packetarium™ network processing boards 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 boards. The Intel® Xeon-based server board provides storage, system-management and remote management network connections.

Each network processing board 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™ network processing boards 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 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 ($I^2C$) bus. A console port and a 1000 Mbps port provide further management interface options. Other network processing boards in the Packetarium family are compatible.

## Hybrid System Specifications

| | | |
|---|---|---|
| Intel® x86 Server System | | |
| Processor System | CPU Processor | 2 x Intel® Xeon Nehalem Quad-Core™ Processors (under 65W) |
| System Memory | Memory Socket | 12 x 240 pin DDR3 DIMM slots |
| | 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 |
| | Max. Speed | 1 GHz |
| System Memory | Memory Socket | 200 pin SODIMM slot |
| | Memory Type and Capacity | Unbuffered 1 GB DDR2 667 MHz DIMM |
| Boot Flash | Boot Flash/type | S29GL01GP11TFIR10 TSOP56 |
| | Max Flash size | 1 Gbit |
| Networking Interface | Ethernet Switch | Broadcom BCM56820 for 10 GbE |
| | Ethernet Port | SFP+ (10 GbE/1 GbE) port x 16 |
| Expansion | Packetarium Board Slot | 2 Slots |
| I/O Interface | x86 Debug Port | RJ-45 RS-232 x 1 |
| | 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 Port | RJ-45 (10/100/1000 Mbps) x 1 |
| Others | | |
| Storage | Storage Interface | SAS/SATA HDD Tray x 2 |
| Power | Type/Watt | 1 + 1 redundant hot-swappable/800 W |
| | Input | AC 110 vac to 240 vac at 50-60 Hz |

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

## Packetarium™ Board

### NCPB-2410 RMI XLR

| Packetarium Network Processing Board | | |
|---|---|---|
| Processor System | Processor | Netlogic XLR732 |
| | Max. Speed | 1.2 GHz |
| | Processor Cores | 8 Cores |
| System Memory | Memory Socket | Two 240-pin DDR2 DIMM slots |
| | Memory type and capacity | ECC registered DDR2 800 MHz DIMMs, up to 4 GB |
| Boot Flash | Redudant Boot Flash/type | S29GL01GP11TFIR10 TSOP56 |
| | Max Flash size | 1 Gbit |
| Interface | Physical Connectioin | PCIe x 1 + PCIe x 16 Gold Fingers |
| | Logical Connection | Two PCIe x4<br>Two XAUI<br>One 1000 Mbps |
| Cooling | CPU Heatsink | Passive Aluminum Cooler |
| SW Support | Bootloader | Netlogic XLR SDK |
| | Operating System | Linux Kernel 2.6 |
| Physical Dimensions | Dimensions | 245.6 (W) x 148.6 (H) 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™ Boards |
| NCPB-2410 | Packetarium™ Board RMI XLR 732 |

# NCP-7560

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


## Features

- Advantech Packetarium™ design
- Scalable from 1 to 8 multi-Core Packetarium™ network processing boards
- SAS/SATA controller for 2 x AdvancedMCs with 2.5" storage devices
- 6 x 10GbE and 16 x 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™ support
- Designed for NEBS 3.0

TAIWAN EXCELLENCE 2010 RoHS COMPLIANT 2002/95/EC

## 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 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, system management and external network connections.

Each Network Processing Board 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™ Network Processing Boards are based on the Cavium Octeon CN5650 (12 Cores). Each board supports up to 16 GB of memory on four DIMM sockets. Two PCIe x4 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.

## Ethernet Switch System Specification

| | | |
|---|---|---|
| Processor System | Local Management Processor | Freescale MPC8545 PowerQUICC™ III |
| | Max Speed | 1 GHz |
| System Memory | Memory Socket | 200 pin SODIMM slot |
| | Memory type and capacity | Unbuffered 1 GB DDR2 667 MHz DIMM |
| Boot Flash | Redundant Boot Flash/type | 4 x S29GL01GP11TFIR10 TSOP56 |
| | Max Flash size | 512 MB |
| Networking Interface | Ethernet Switch | Broadcom BCM56820 for 10 Gb<br>Broadcom BCM56512 for 1 Gb |
| | Ethernet Port | SFP+ (10 Gb/1 Gb) ports x 6<br>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 Board Slot | 8 slots |
| Storage Subsystem | Controller | LSISAS1064e PCIe Gen1<br>SAS/SATA HDD supportted |
| | Storage Interface | 2 mid-size, single width SAS/SATA shared with AMC bay<br>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® Debug Port | TYPE-B USB 2.0 x 1 |
| | LMP USB Ports | TYPE-A USB 2.0 x 2 |

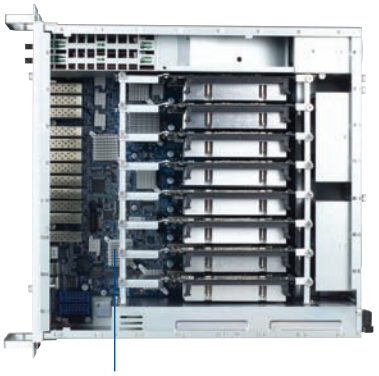
## Ethernet Switch System Specification (Continued)

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

## Packetarium™ Board Specification

### NCPB-2310 Cavium Octeon Plus

| | | |
|---|---|---|
| Processor System | Processor | Cavium Octeon CN5650 |
| | Max Speed | 800 MHz |
| | Processor Cores | 12 |
| System Memory | Memory Socket | Four 240 pin DIMM slots |
| | Memory type and capacity | ECC registered DDR2 800 MHz DIMMs, up to 8 GB per processor |
| Boot Flash | Redundant Flash type | 4 x S29GL01GP11TFIR10 TSOP56 |
| | Max Flash size | 512 MB |
| Interface | Physical Connection | PCIe x 1 + PCIe x16 Gold Fingers |
| | Logical Connection | Two PCIe x4<br>Two XAUI<br>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<br>WR PNELE2.0 (option) |
| Physical Dimension | Dimension | 245.6 (W) x 148.6 (H) mm (9.67" x 5.85") |
| | Weight | 0.53 Kg (Net) |



Main Ethernet Switch Board

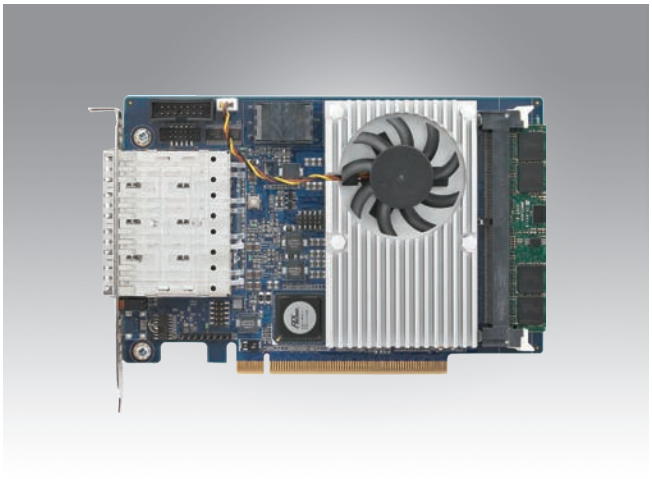
Packetarium™ Board

## Ordering Information

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

# PCIE-2300E

## High Performance Content Processing and Inspection Network PCIe Card



## Features

- Quad 1GbE SFP ports , half-length PCIe x16 interface
- Regular expression pattern matching accelerator
- Netlogic NLS1008 layer 7 network content processor
- ECC registered 512MB DDR3 memory for NLS1008
- Cavium OCTEON Plus CN5650 1 GHz network processor
- ECC registered 2GB DDR2 DIMM for CN5650

## Introduction

The NCPB-2300E is a regular expression pattern matching accelerator and provides super high speed network processing capability with its network processors which offload processing from the host system. PCI Express Gen 2 host interface also maximizes throughput and minimizes latency. The PCIE-2300E can be loaded with up to four copper or optical SFP modules, and enables wire-speed, deterministic content inspection with Netlogic NLS1008 Layer 7 content processor. It can be programmed to meet a variety of applications with Cavium Octeon Plus CN5650 network services processor.

## Specifications

| | | |
|---|---|---|
| Processor System | Processor 1 | Cavium OCTEON Plus CN5650 |
| | Max. Speed | 1 GHz |
| | Processor Cores | 12 Cores |
| | Processor 2 | Netlogic NLS1008 |
| | Max. Speed | Up to 120 Gbps of Layer 7 content processing |
| System Memory | Memory for CN5650 | ECC registered 2 GB DDR2 800 MHz VLP mini-DIMM |
| | Memory for NLS1008 | ECC registered 512 MB DDR3 800 MHz memory |
| Boot Flash | Flash Type | JS28F512 M29EWH 5940A374 x 1 |
| | Max Flash size | 1 Gb |
| Networking Interface | Ethernet Switch | PLX PEX8619, PCIe Gen2 swtich with DMA |
| | Ethernet Port | SFP (1000Base-SX or 1000Base-T) ports x 4 |
| Management Interface | Management Port | USB (UART) port x 1 |
| Interface | Physical Connectioin | PCIe x16 Gold Fingers |
| | Logical Connection | PCIe x4 |
| Cooling | CPU Heatsink | Passive Aluminum Cooler |
| SW Support | Bootloader | Cavium SDK 1.9, U Boot |
| | Operating System | Debian Linux Kernel 2.6.27 |
| | Driver | NLS1008 Driver |
| Physical Characteristics | Dimensions | 180.88 (W) x 21.59 (D) x 126.31 (H) mm (7.12" x 0.85 x 4.97") |
| | Weight | 0.26kg |
| Environment | Operating Environment | Temperature: -5 to 50° C<br>Humidity: 45% to 90% RH |
| | Storage Temperatures | Temperature: -40 to 70° C<br>Humidity: 60% to 95% RH |
| Compliance | EMC/Safety | CE/FCC/UL/CB |

## Ordering information

| Part Number | Description |
|---|---|
| NCPB-2300-DA0E | PCIe network adapter w/Cavium OCTEON CN5650 and Netlogic NLS1008 |

# NCP-3108

## Single Multi-Core MIPS64-based Cavium OCTEON™ Network Appliance

## Features

- MIPS64 Octeon™ processor with 16 Cores each and up to 1 GHz
- Supports security, regular expression and de-/compression engine
- Up to 8 Gigabit Ethernet ports
- Supports one 64-bit/ 66 MHz PCI-X slot
- Supports two 2.5" SATA HDD

## Specifications

| | | | |
|---|---|---|---|
| Processor System | Processor | Cavium Octeon CN5860(SCP) | |
| | Max Speed | 500 Mhz / 800 Mhz | |
| | Processor Cores | 16 | |
| | Encryption Engine | Yes | |
| | TCP Acceleration | Yes | |
| System Memory | Memory Socket | Four 240-pin DIMM slots | |
| | Memory Type and Capacity | ECC registered DDR2 DIMM, up to 8 GB | |
| Boot Flash | Flash Type | S29JL064H x 1 | |
| | Max Flash Size | 64Mb | |
| Networking Interface | Ethernet Data Port | 100/1000 Mbps Gigabit ports x 4, with LED indicators<br>SFP Connector x 4 | |
| Expansion | PCI-X Slot | One 64-bit/ 66 MHz PCI-X Slot | |
| Storage System | Controller | Silicon Image Sil3124-II SATA PCI 64-bit/ 66 MHz | |
| | Storage Interface | Two 2.5" SATA H.D.D tray | |
| I/O Interface | Serial Port | DB9 RS232 x 1 | |
| Power | Type/Watt | AC:Zippy H1U-6250P 250 W or DC: DP1A-6251F, 250 W | |
| | Input | AC 100 ~ 264 $V_{AC}$ Full Range or DC DC48V input, ATX250 W | |
| Cooling | CPU Heatsink | Passive Copper Fin Heatsink, with heatpipe | |
| | FAN | 2 FANs | |
| Physical Dimensions | Dimension | 426 (W) x 403.6 (D) x 44 (H) mm (16.8" x 15.88" x 1.7") | |
| | Weight | 5 Kg | |
| Environment | | Temperature | Humidity |
| | Operating Enviroment | 0 to 40° C | 20% to 90 % RH |
| | Storage Temperatures | -20 to 70° C | 5% to 95 % RH |
| Compliance | EMC/Safety | CE/ FCC/ UL/CB | |

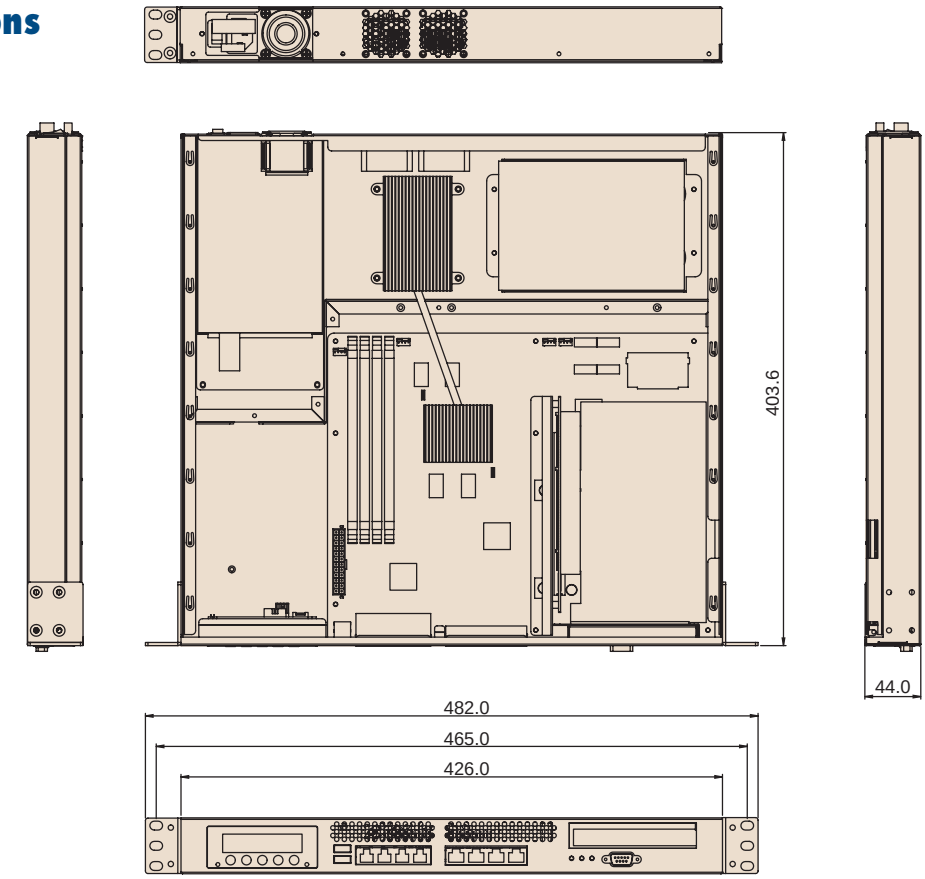


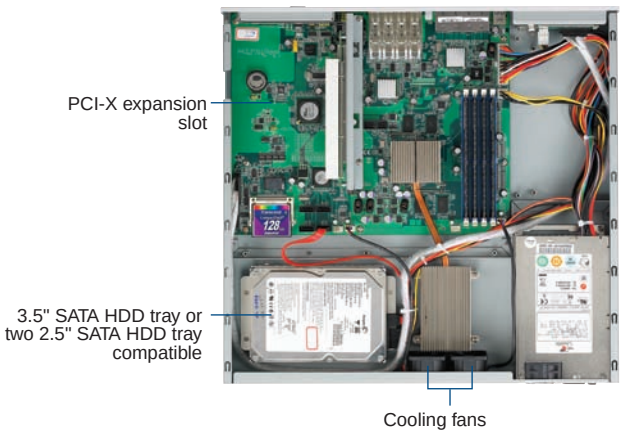


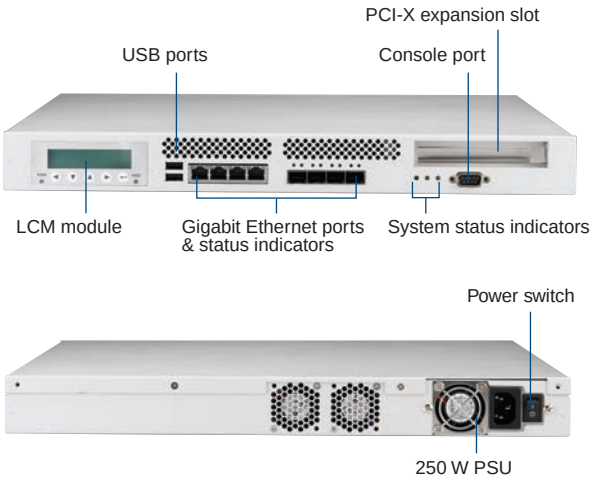
Last updated : 9-Feb-2011

## Dimensions

Unit: mm (inch)




## Ordering Information

| Part Number | CPU |
|---|---|
| NCP-3108-FCABE | 1 x CN5860 (SCP) (800MHz) |

# NCP-5120(B)

## Dual Cavium OCTEON MIPS64 Multi-Core Processor-based Network Appliance

## Features

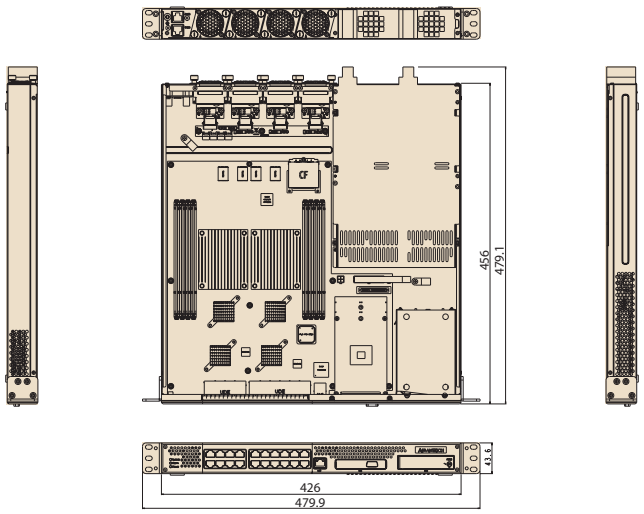
- Dual Cavium OcteonPlus CN5860-SCP 800 MHz, MIPS64 Processors with 16 Cores each
- Supports Security and de-/compression engine
- Up to 20 Gigabit Ethernet ports
- Supports one 64-bit/66 MHz PCI-X slot
- Supports one 2.5" SATA HDD

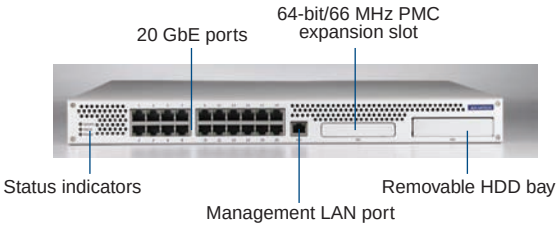
## Specifications

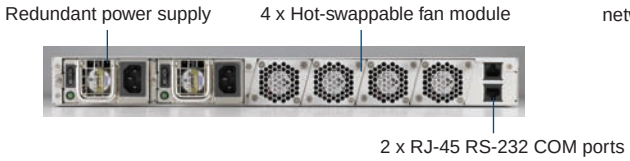
| | | | |
|---|---|---|---|
| Processor System | Processor | Cavium Octeon CN5860 (SCP) | |
| | Max Speed | 800 MHz | |
| | Processor Cores | 16 | |
| | Encryption Engine | Yes | |
| | TCP Acceleration | Yes | |
| | Inter Processor Communication | * Data plane, multi-channel SPI 4.2 between OCTEON processors<br>* Control plane, PCI-X 64/66 Primary configured as host and secondary as target mode) | |
| System Memory | Memory Socket | Eight 240-pin DIMM slots | |
| | Memory Type and Capacity | ECC registered DDR2 400 MHz DIMMs, up to 8 G per processor | |
| Boot Flash | Flash Type | 4 x S29GL01GP | |
| | Max Flash Size | 4Gb | |
| Networking Interface | Data Port Controller | Intel® IXF1024 10-port 10/100/1000 Gigabit Ethernet MAC x 2 | |
| | Ethernet Data Port | 10/100/1000 Mbps ports x 20 with LED indicators. Support 802.1Q and 802.1P in software and CPLD | |
| | Management Port Controller | Intel® 82546 PCI-X 64/66 GbE LAN | |
| | Management Port | 10/100/1000 Mbps port x 2 with LED indicator, support 802.1Q and 802.1P | |
| Expansion | PMC Slot | One 64-bits/66MHz PCI-X Slot | |
| Storage System | Controller | Silicon Image Sil3124-II SATA<br>PCI-X 64-bits/66 MHz | |
| | Storage Interface | One 2.5" SATA removable HDD tray<br>One CF slot up to 16GB | |
| I/O Interface | Serial Port | RJ-45 RS-232 x 2, one for each processor | |
| | Debug Port | JTAG pin header x 2, one for each processor | |
| Power | Type/Watt | 1 + 1 redundant hot-swappable SPS / 250W + 250W | |
| | Input | AC 90 ~ 264 VAC Full Range | |
| Cooling | CPU Heatsink | Passive Copper Fin Heatsink | |
| | FAN | 4 x hot-swappable fans | |
| SW Support | Bootloader | Cavium SDK 1.7.2 U Boot 1.1 | |
| | Operating System | Debian Linux Kernel 2.6.14 MIPS | |
| Physical Dimnsions | Dimension | 426 (W) x 418 (D) x 44 (H) mm (16.8" x 17" x 1.7") | |
| | Weight | 8.2 Kg | |
| Environment | | Temperature | Humidity |
| | Operating Enviroment | 0 to 40° C | 20% to 90 % RH |
| | Storage Temperatures | -20 to 70° C | 5% to 95 % RH |
| Compliance | EMC/Safety | CE/ FCC/ UL/CB | |

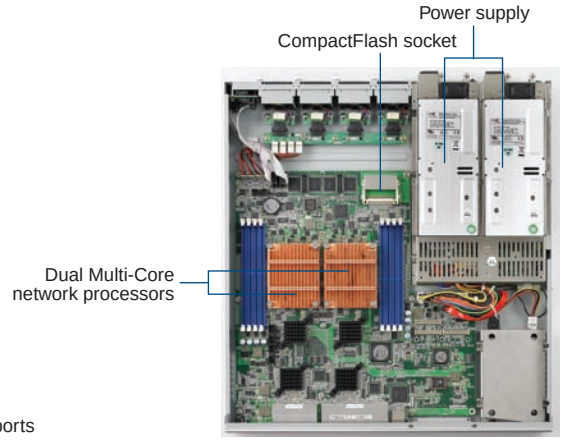
## Dimensions

Unit: mm




## Ordering Information

| Part Number | CPU | Manager port | Ethernet port |
|---|---|---|---|
| NCP-5120-CCABE | CN5860 (SCP)/800 MHz | 2 | 20 |

# FWA-6480

## Two Dual/Quad-Core™ Intel® Xeon® Processor-based 2U Rackmount Platform with up to 8 GbE LAN Ports

## Features

- Dual Intel® Xeon® processors with 4/6 MB L2 cache, FSB support 1066/1333 MHz
- Supports Dual-Core™/Quad-Core™ Intel® Xeon® processors 5100/5200/5300/ 5400 series
- DDR2 533/667 ECC registered memory, up to 16 GB
- Eight 10/100/1000 Mbps LAN ports with LAN bypass
- Supports 8 RJ-45 connectors or 4 SFP's and 4 RJ-45 connectors
- Supports PCIe or PCI-X add-in cards
- Supports two hot-swappable front 3.5" SATA HDD

## Introduction

Built with functionality and availability in mind, the FWA-6480 Network Application Platform provides high-performance and an abundant feature set for enterprise-level network communication appliances. Designed with the Intel® 5100 MCH chipset, the FWA-6480 can support both single or dual processors with Intel® Xeon 64-bit Quad-Core or Dual-Core 5400/5300/5200/5100 series processors. Utilizing Intel® VT technology significantly improves system performance for networking environments. Incorporating an Intel® I/O controller Hub, ICH9R and other I/O subsystems, the system provides optimized computing efficiency and high-speed I/O bandwidth ideal for networking applications.

The FWA-6480 supports DDR2 533/667 MHz ECC registered memory, Serial ATA and PCI Express technologies, which optimize the system for space constrained installations. It supports different I/O combinations, such as the Intel® 5100 MCH which can provide either three PCIe x8 or 6 PCIe x4 interfaces. This ultra dense platform is built with a redundant power supply, which further increases the system's fault tolerance level.

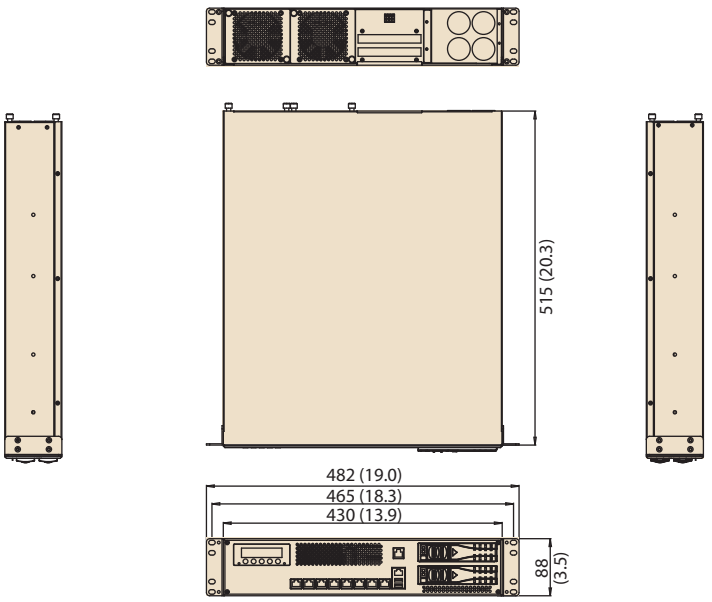
This 2U rackmount system supports two hot-swappable 3.5" SATA HDDs and CompactFlash for OS and network security applications. Also located on the front panel is an RJ-45 serial port, a 10/100 management LAN port, two USB ports and an LCD module for local system management, maintenance, and diagnostics.

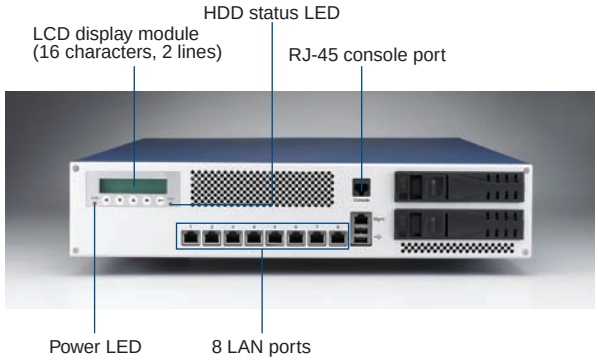
## Specifications

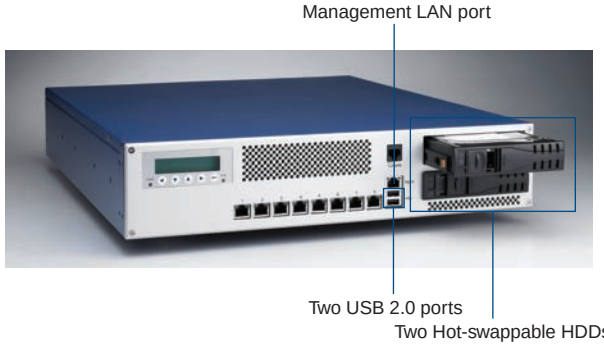
| | | | |
|---|---|---|---|
| Processor System | CPU | 2 x Intel® Dual-Core™ 5100/5200 Series and Intel® Quad-Core™ 5300/5400 series processors | |
| | Max. Speed | Dual-Core™ up to 3.0 GHz and Quad-Core™ up to 2.8 GHz | |
| | Front Side Bus | 1066/1333 MHz | |
| | Chipset | Intel® 5100P + ICH9R | |
| Memory | Technology | Dual Channel DDR2 533/677 MHz ECC registered | |
| | Capacity | Up to 16 GB with 4 DIMMs, 4G dual rank memory module | |
| BUS | PCIe | 2 x PCIe x8 connects to I/O board<br>5 x PCIe x1 connects to I/O board<br>1 x PCIe x8 slot for riser card | |
| | Riser Card | 2 x PCI-E x8 slots<br>Supports full-height cards and external access, such as 10 G Ethernet card | |
| | PCI | 1 x PCI 32-bit/33 MHz slot | |
| Ethernet | Management Port | 1 x Intel® 82573E 10/100/1000 Mbps Ethernet | |
| | Interface | 4 x GbE via RJ-45 interface<br>4 x GbE via SFP interface from Intel® 82571 Ethernet Controller supports 2 segments LAN bypass | |
| Storage | SATA | Supports 2 x 3.5" hot-swappable SATA HDD, front accessible | |
| | Compact Flash socket | 1 x CF socket | |
| Peripheral | USB | 1 x USB 2.0 in the front | |
| | Serial | 1 x console port in the front by RJ-45 connector | |
| | LCD Module | 1 | |
| Power | Watts | 500 W, 2U height (1+1 redundant, 500 W each) | |
| | 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% |
| Physical | Dimensions (W x H x D) | 430 x 88 x 515 mm (16.9" x 3.5" x 20.3") | |
| | Weight | 18 kg (40 lb) | |

## Dimensions

Unit: mm (inch)




## Ordering Information

| Part number | Processor |
|---|---|
| FWA-6480CFE | 4 ports GE RJ45 + 4 ports GE SFP |

## Packing List

| P/N | Description |
|---|---|
| 1700002463 | Cable RJ-45 to Console 9P 220 cm T |

## Accessory

| P/N | Description |
|---|---|
| 1702002600 | 3P 180 cm, USA |
| 1702002605 | 3P 180 cm, Europe |
| 1702031801 | 3P 180 cm, UK |
| 1700000237 | 3P 180 cm, JP |

# FWA-6500

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


## Features

- 2 x Intel® Xeon® processors 5500/5600 series with QPI up to 6.4 GTs
- 12 x DDR3 1066/1333 registered ECC memory up to 96 GB
- 4 x 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
- 2 x PCI-E full-height/ half-length add-on cards
- 2 x 2.5" removable SATA HDD (3.5" removable SATA HDD for optional)
- 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® Xeon Dual/Quad-Core™ processors are based on the Intel® 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 FWA-6500 is also capable of supporting two 3.5" SATA hard disk drives with condition support on the riser card. 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.

## Specifications

| | | | |
|---|---|---|---|
| Processor | CPU | 2 x Intel® Xeon Dual/Quad-Core™ processors | |
| | Max. Speed | Intel® Xeon Processor 5500/5600 series with QPI up to 6.4GT/s | |
| | L2 Cache | 4 MB/8 MB | |
| Memory | Technology | DDR3 1066/1333 MHz ECC registered memory | |
| | Capacity | Up to 96 GB with 12 DIMM | |
| PCIe | Chipset | Intel® 5520 + Intel® ICH10R | |
| | Expansion Slot | 4 x PCIe x8 slots connect to NIC module<br>2 x PCIe x4 slots for riser card<br>1 x PCIe x4 slot for management board | |
| | Riser Card | 2 x PCIe x4 riser cards<br>Supports full-height/half-length cards and external access | |
| Ethernet | Management Port | 2 x Intel® 82574E 10/100/1000 Mbps Ethernet | |
| | NIC Module | 4 x NIC modules | |
| | Gigabit Ethernet | Copper module includes 4 x Gigabit Ethernet ports with Intel® 82576 Ethernet controller by RJ-45 interface<br>Fiber module includes 4 x Gigabit Ethernet ports with Intel® 82576 Ethernet controller by SFP interface | |
| | LAN Bypass | Up to 8 segments on the copper option | |
| | 10GE Module | Intel® 82599ES 10GE controller<br>Supports 2-port 10GE by SFP+ interface | |
| Storage | SATA | 2 x 2.5" Hot-swappable SATA hard drive in the front<br>2 x 3.5" Hot-swappable SATA hard drive in the front (Optional) | |
| | Compact Flash | 1 x CF Socket | |
| Remote Management | IPMI | Hitachi H8 BMC | |
| Peripheral | USB | 2 x USB 2.0 ports in the front | |
| | Serial | 1 x RJ-45 console port connector in the front | |
| | LCD Module | 1 | |
| Power | Watts | 600W 2U (1+1 redundant, 600W each) | |
| | 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% |
| Physical | Dimensions (W x H x D) | 430 x 80 x 547.6 mm | |
| | Weight | 18 kg (40 lb) | |

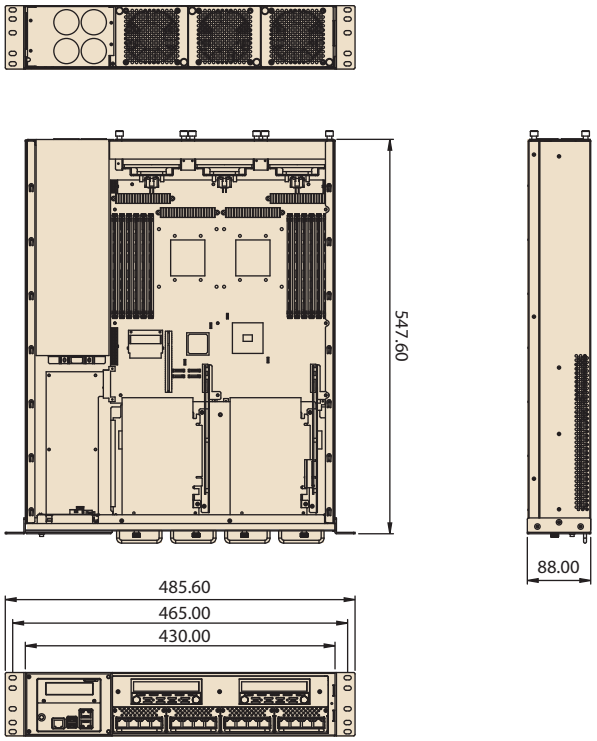




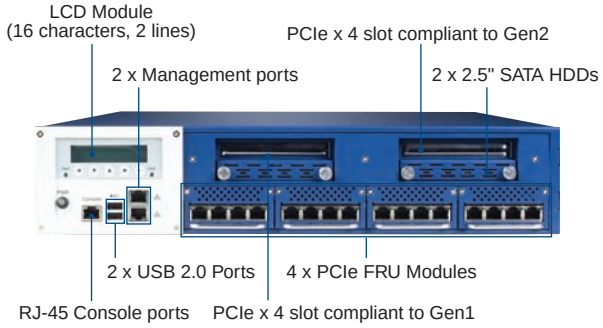
Last updated : 9-Feb-2011

## Dimensions

Unit: mm








## Ordering Information

| Model Number | Configuration |
|---|---|
| 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-ports GE SFP Module w/o LAN bypass |
| NAEM-0103E | 4-ports 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

| P/N | Description |
|---|---|
| 1702002600 | 3P 180 cm, USA |
| 1702002605 | 3P 180 cm, Europe |
| 1702031801 | 3P 180 cm, UK |
| 1700000237 | 3P 180 cm, JP |

## Packing List

| P/N | Description |
|---|---|
| 1700002463 | Cable RJ-45 to Console 9P 220 cm T |

# FWA-3305

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


## Features

- Supports Intel® Atom™ D510/D410/N450 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.

## Specifications

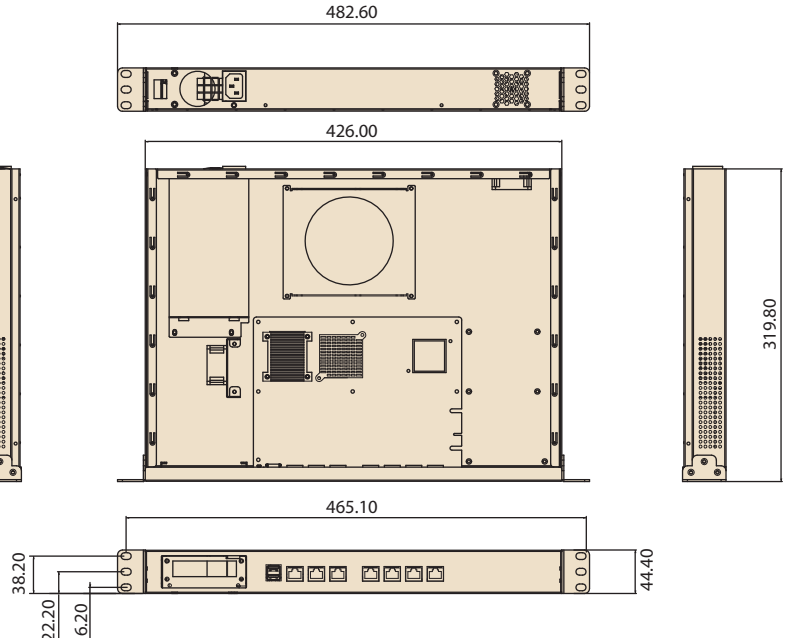
| | | | |
|---|---|---|---|
| Processor System | CPU (45 nm) | Intel® Atom D510 | Intel® Atom D410 |
| | Max. Speed | 1.66 GHz (Dual Core) | 1.66 GHz (Single Core) |
| | L2 Cache | 1 M | 512 KB |
| | Chipset | ICH8M | |
| | BIOS | AMI 16 Mbit SPI | |
| Memory | Technology | Single-channel DDR2 667/800 SODIMM | |
| | Capacity | Up to 4 G | |
| Expansion | PCI Express (PCIe) | 1 proprietary internal PCIe x1 connector for LAN expansion board (optional) | |
| | Mini PCIe | Optional | |
| | PCI | PCI 32-bit/33 MHZ PCI Slot | |
| Ethernet | Gigabit Ethernet | 1 x 82567V GbE,1 x 82583V GbE<br>4 10/100/1000 Mbps PCIe GbE ports | |
| | GbE Controller | 4 x Intel® 82583V | |
| | LAN Bypass | 2 segment on GbE ports | |
| Storage | SATA | SATA connector x 3 on separate SATA channels<br>Max. data transfer rate 300 MB/s<br>Support 3.5" SATA HDD x 1 | |
| | CompactFlash Socket | 1 CF socket on IDE 0 (Primary/Master) | |
| Peripheral | USB | 2 (USB 2.0) | |
| | Serial | 1 (RJ45) | |
| | LCD Module | 1 | |
| | K/B, Mouse, LPT, CRT, COM | Pin Headers | |
| Power | Watt | 100 W | |
| | Input | 90 ~ 240 V AC, auto 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) | 426 x 44 x 320 mm (16.7" x 1.7" x 12.6") | |
| | Weight | 4.5 kg (9.9 lb) | |



Last updated : 9-Feb-2011

## Dimensions

Unit: mm (inch)




## Ordering Information

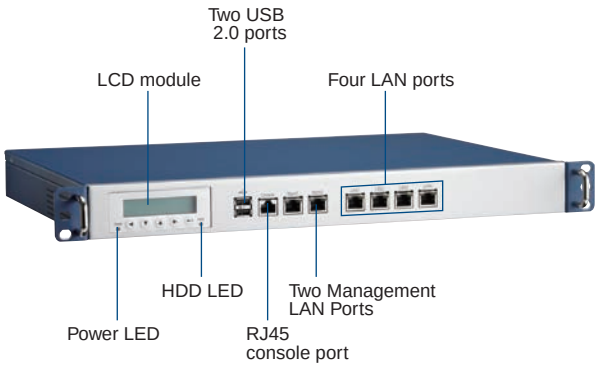
| Part Number | Processor | LAN | Power Supply |
|---|---|---|---|
| FWA-3305-00A1E | D410 | 6 | 100W |
| FWA-3305-01A1E | D510 | 6 | 100W |

## Packing List

| Part Number | Description |
|---|---|
| 1700000298 | VGA port cable (for system installation use) |
| 1700018155 | PS/2 Keyboard/Mouse Cable 20CM |
| 1700009572 | SATA Data Cable 20CM |
| 1700002463 | Console Cable RJ45 220cm |

## Accessories

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



# FWA-3710

## 1U Rackmount Intel® Pentium® M Processor-based Platform with 4 GbE LAN Ports

## Features

- Supports Intel® Pentium® M or Celeron® M processor
- Dual-channel DDR2 400/533 SODIMM, up to 2 GB
- Four 10/100/1000 Mbps LAN ports
- One proprietary PCIe expansion connector onboard
- Supports one fixed 3.5" IDE or SATA HDD
- One 10/100 Mbps LAN port for management

## Introduction

Conceived as a powerful but low power consumption rackmount Internet security platform, the FWA-3710 series was specifically designed for mainstream IDS/IPS, anti-virus, VPN gateway and Unified Threat Management (UTM) applications. Using the latest Intel® Pentium M processor combined with the Mobile Intel® 915GM Express chipset and Intel's ICH6M I/O Controller Hub, the FWA-3710 series provides unprecedented performance, connectivity and throughput without compromising on system thermal design. It supports up to 2 GB of DDR2 system memory at 400 or 533 MHz on dual-channel SODIMM banks. By leveraging PCI Express technology, the platforms maximize I/O throughput by taking full advantage of the ICH6-M's PCI Express (PCIe) capability. Four PCIe lanes connect directly to the Ethernet controllers to provide bi-directional 2 Gb/s peak bandwidth for Gigabit Ethernet support at wire speed. The system supports one optional 3.5" IDE or SATA HDD, and CompactFlash for OS and Internet security applications. The front panel has a 9-pin RS-232 serial port and one 10/100 managed LAN port, with an LCD module for local system management, maintenance and diagnostics. It is FCC, CE, CCC, and UL compliant.

## Specifications

| | | | |
|---|---|---|---|
| Processor System | CPU | Intel® Pentium M / Celeron M processor | |
| | Max. Speed | 2.0 GHz/1.5 GHz | |
| | Chipset | Intel® 915GME + ICH6M | |
| | Front Side Bus | 533/400 MHz | |
| | BIOS | Award™ 4 Mbit Flash | |
| Memory | Technology | Dual-channel DDR2 533/400 SODIMM | |
| | Capacity | Up to 2 GB with 2 slots | |
| Expansion | Onboard Expansion Slots | 1 proprietary internal PCIe x4 connector | |
| Ethernet | Fast Ethernet | 1 10/100 Intel® 82562 FE port for management | |
| | Gigabit Ethernet | 4 10/100/1000 Mbps GbE ports | |
| | GbE Controller | 4 x Intel® 82573 | |
| | LAN Bypass | 2 segment on GbE ports | |
| Storage | Controller | Supports 3.5" HDD x 1 on IDE 0, or SATA HDD x 1 | |
| | | - ATA100 connector x 1 on IDE 0 (Secondary) | |
| | | - Max. data transfer rate 100 MB/s | |
| | | - Supports 3.5" ATA HDD | |
| | SATA | SATA interface | |
| | | - SATA connector x 1 on separate SATA channels | |
| | | - Max. data transfer rate 150 MB/s | |
| | | - Support 3.5" SATA HDD | |
| | CompactFlash Socket | 1 CF socket on IDE 0 (Primary/Master) | |
| Peripheral | USB | 2 (USB 2.0) | |
| | Serial | 1 (RS-232) | |
| | LCD Module | 1 | |
| | K/B, Mouse, LPT, CRT, COM | Pin Headers | |
| Power | Watts | 180 W | |
| | Input | 90 ~ 240 V AC, auto 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) | 426 x 44 x 280 mm (16.7" x 1.7" x 11") | |
| | Weight | 4.5 kg (9.9 lb) | |

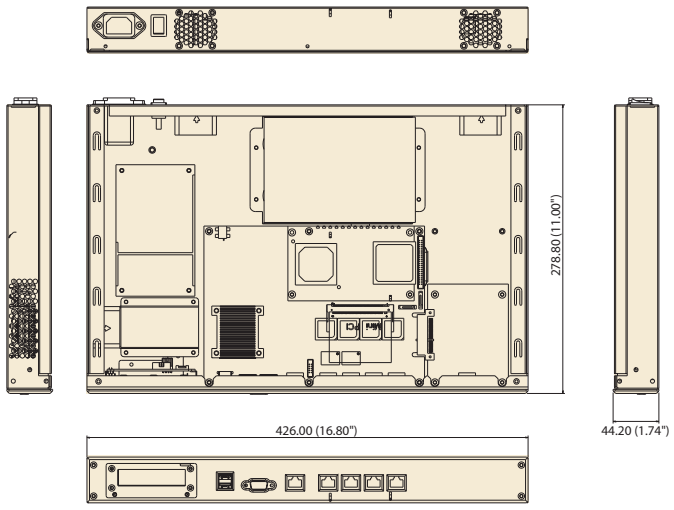




Last updated : 9-Feb-2011

## Dimensions

Unit: mm (inch)




## Ordering Information

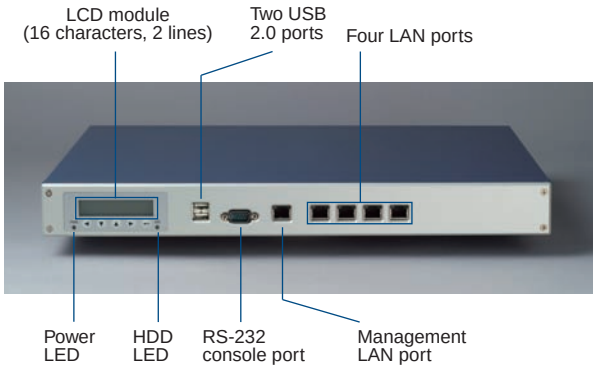
| Part Number | Processor | LAN | Power Supply | Ethernet Controller |
|---|---|---|---|---|
| FWA-3710E | - | 5 | 180 W | 4 x Intel® 82573 |

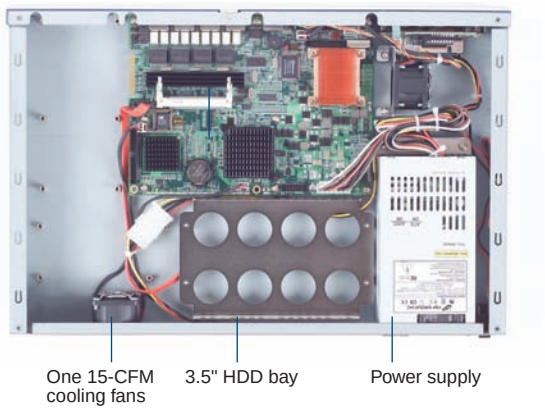
## Packing List

| Part Number | Description |
|---|---|
| 1701160101 | VGA port cable (for system installation use) |
| 1703092000 | Console cable D-sub 9-pin 2 m |

## Accessories

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



# FWA-3860

## 1U Rackmount Intel® Core™2 Duo Processor-based Platform with 6 GbE LAN Ports

## Features

- Supports Intel® Core™2 Duo processor
- Intel® Q965 chipset, 1066 MHz FSB
- Dual-channel DDR2 memory, up to 4 GB
- 6 x PCIe GbE LAN ports w/LAN bypass
- 1 x proprietary PCIe x4 connector for LAN expansion board
- Supports 1 x 3.5" SATA HDD

## Introduction

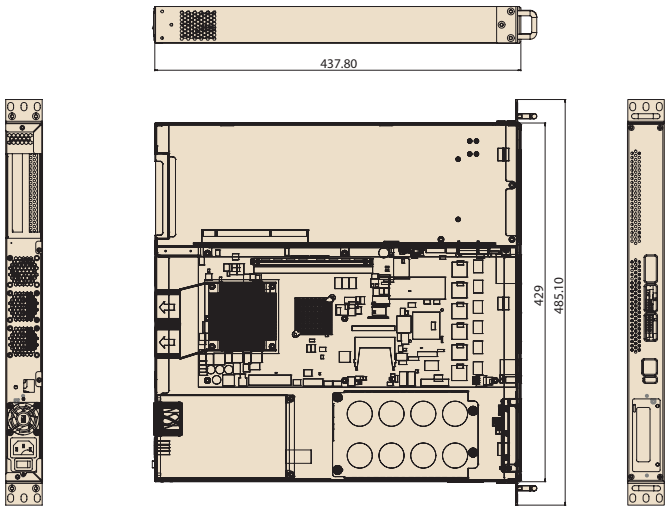
A high-performance and power-efficient network security platform, the FWA-3860 is specifically designed for advanced Internet security applications where performance is in high demand. The FWA-3860 adopts the latest Intel® Core™2 Duo processor and Intel® Q965 chipset. This supports up to 4 GB of dual-channel DDR2 SDRAM on two DIMMs. The platform reserves space for one 3.5" SATA HDD and one CompactFlash slot for storing or upgrading the OS and other network security applications. By leveraging PCI Express (PCIe) technology, the FWA-3860 takes full advantage of the ICH8D0 PCIe capability to maximize I/O throughput. The platform has six PCIe x1 lanes connected directly to the Intel® 82573 Ethernet controllers 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.

## Specifications

| | | | |
|---|---|---|---|
| Processor System | CPU | Intel® Core™2 Duo / Intel® Pentium 4 | |
| | Max Speed | 2.66 GHz/ 3.4 GHz/ 3.4 GHz | |
| | Chipset | Intel® Q965 and ICH8D0 | |
| | Front Side Bus | 1066/ 800 MHz | |
| | BIOS | Award™ 16 Mbit SPI | |
| Memory | Technology | Dual-channel DDR2 533/ 667/ 800 MHz | |
| | Max. Capacity | Up to 4 GB with 2 slots | |
| Onboard Expansion | PCI Express (PCIe) | 1 proprietary internal PCIe x4 connector for LAN expansion board | |
| | Riser Card | 2 PCI-X 100 slots (Option) support full-height cards and external access | |
| Ethernet | Interface | 6 x 10/100/1000 Mbps Intel® 82573 GbE ports | |
| | LAN Bypass | 3 segments in pairs | |
| Storage | SATA | Supports 1 x 3.5" SATA HDD. Max. data transfer rate 300 MB/s | |
| | CompactFlash Socket | 1 CF socket | |
| Peripheral | USB | 1 (USB2.0) | |
| | Serial | 1 (RJ-45) | |
| | LCD Module | 1 | |
| Power | Watts | 250 W | |
| | 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 % |
| Physical | Dimensions (W x H x D) | 430 x 44 x 435 mm (17" x 1.7" x 17.1") | |
| | Weight | 4.5 kg (9.9 lb) | |

## Dimensions

Unit: mm

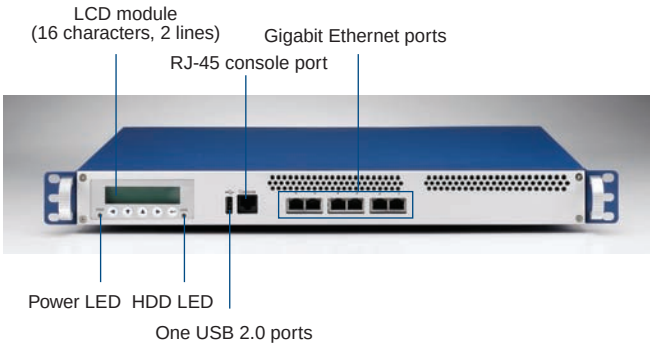



## Ordering Information

| Part Number | LAN | LAN Bypass | Power Supply | PCI-X / PCI slot |
|---|---|---|---|---|
| FWA-3860E | 6 | 3 | 250 W | - |
| FWA-3860RE | 6 | 3 | 250 W | 2 (PCI only support 3.3 V) |

## Accessories

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



# FWA-4208

## 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 4 x DDR3 ECC/REG 1066/1333 DIMMs, up to 32 GB or 4 x DDR3 ECC Un-buffered 1066/1333 DIMMs, up to 16 GB
- 9 x 10/100/1000 Mbps LAN ports
- Supports 1 x 3.5" SATA HDD
- Supports 2 x PCIe Full-height/Half-length add-on cards
- Supports 1 x Express LAN module (Option)

## Introduction

The FWA-4208 is an optimized industry standard 1U platform that supports the new generation Intel® Xeon® 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 PCIe Gen.2 technology, the platform maximizes I/O throughput by taking full advantage of the Intel® Xeon® processor X3400 capability. Multiple Gigabit Ethernet controllers provide bi-directional 2 Gb/s peak bandwidth at wire speed for each port and the PCIe interface connects to the Intel® 3420 PCH directly. The system supports up to 9 x Gigabit Ethernet ports, 1 x PCIe x 4 NIC modules, up to 2 x PCIe Gen.2 x 8 expansion slots, and a 1 x 3.5 inch internal SATA HDD. It is FCC, CE, UL, CCC, and RoHS compliant.

## Specifications

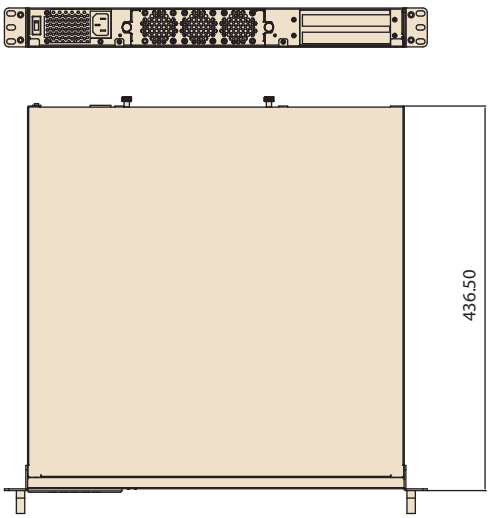
| | | | |
|---|---|---|---|
| Processor | CPU | Intel® Xeon® X3400 processor/ Intel® Core™ i5/i3 processor | |
| | Max. Speed | 2.93 GHz/3.06 GHz | |
| | L2 Cache | 4 MB/8 MB | |
| Chipset | PCH | Intel® 3420 PCH | |
| Memory | Technology | DDR3 1333/1066 MHz ECC/REG or ECC Un-buffered memory | |
| | Capacity | Supports up to 32 GB DDR3 ECC Registered memory (RDIMM)<br>Supports up to 16 GB DDR3 ECC Un-buffered memory (UDIMM) | |
| PCI-Express | Expansion Slot | 1 x PCIe Gen2 x 8 internal Gold fingers for NIC module | |
| | Riser Card | 1 x PCIe Gen2 x 8 slots by PCIe Gen2 x 8 Lanes<br>Supports full-height/half-length cards and external access | |
| Ethernet | Gigabit Port | 9 x Intel® 82574L 10/100/1000 Mbps 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 | |
| | Compact Flash | 1 x CF Socket | |
| Peripheral | USB | 2 x USB 2.0 connectors | |
| | Serial | 1 x console port via RJ-45 connector | |
| | LCD Module | 1 | |
| Power | Watts | 250W | |
| | 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% |
| Physical | Dimensions (W x H x D) | 430 x 44 x 436.5 mm (16.9" x 1.7" x 17.1") | |
| | Weight | 10 kg | |

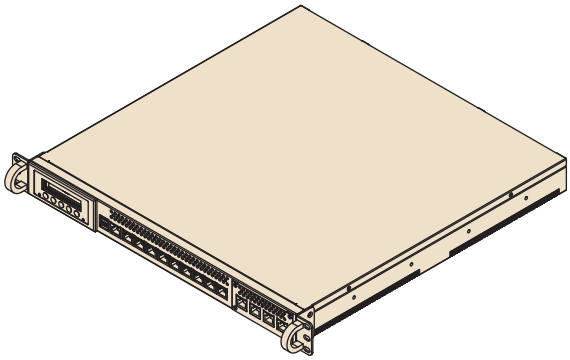


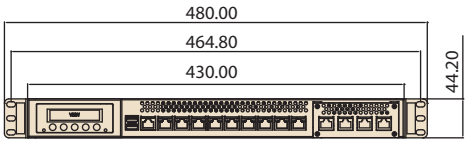
Last updated : 9-Feb-2011

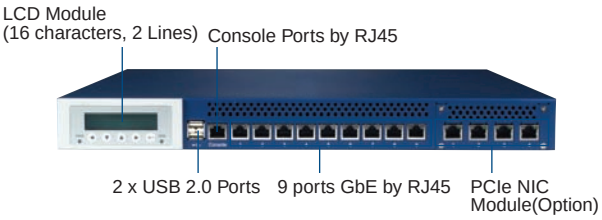
## Dimensions

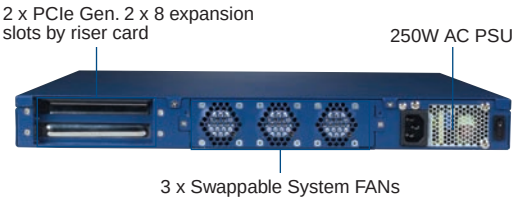
Unit: mm (inch)






## Ordering Information

| Part Number | Configuration |
|---|---|
| FWA-4208E | FWA-4208 1U barebone |

## Accessories

| P/N | Description |
|---|---|
| 1702002600 | 3P 180 cm, USA |
| 1702002605 | 3P 180 cm, Europe |
| 1702031801 | 3P 180 cm, UK |
| 1700000237 | 3P 180 cm, JP |

## Packing List

| P/N | 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.

# FWA-710

## Tabletop Intel® Pentium® M Processor-based Platform with 4 GbE LAN Ports

## Features

- Supports Intel® Pentium® M or Celeron® M processor
- Dual-channel DDR2 400/533 SODIMM, up to 2 GB
- Four 10/100/1000 Mbps LAN ports
- One MINI PCI Slot
- Supports one fixed 2.5" IDE HDD
- One 10/100 Mbps LAN port for management

## Introduction

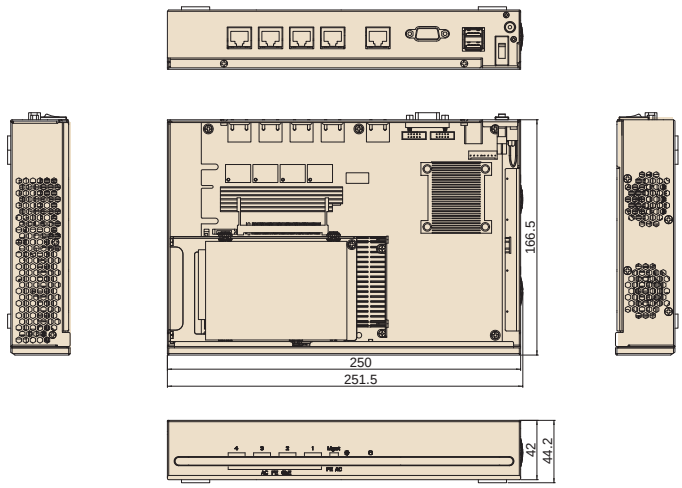
Conceived as an exceptional but low power consuming tabletop Internet security platform, the FWA-710 series was specifically designed for SMBs/SOHOs that require a single device to combine functions such as IDS/IPS, anti-virus, VPN gateway and Unified Threat Management (UTM) in to a multi-functional gateway. Using the latest Intel® Pentium M processor combined with the Mobile Intel® 915GM Express chipset and Intel® ICH6M I/O Controller Hub, the FWA-710 series provides unprecedented performance, connectivity and throughput without compromising on system thermal design. It supports up to 2 GB of DDR2 system memory at 400 or 533 MHz on dual-channel SODIMM banks. By leveraging PCI Express technology, the platforms maximizes I/O throughput by taking full advantage of the ICH6-M's PCI Express (PCIe) capability. Four PCIe lanes connect directly to the Ethernet controllers to provide bi-directional 2 Gb/s peak bandwidth for Gigabit Ethernet support at wire speed. The system supports one optional 2.5" HDD, and one CompactFlash device for OS and Internet security applications. The rear I/O panel has a 9-pin RS-232 serial port and one 10/100 managed LAN port. It is FCC, CE, UL, CCC, and RoHS compliant.

## Specifications

| | | | |
|---|---|---|---|
| Processor System | CPU | Intel® Pentium M/Celeron M processor | |
| | Max. Speed | 2.0 GHz/1.5 GHz | |
| | Chipset | Intel® 915 GME + ICH6-M | |
| | Front Side Bus | 533/400 MHz | |
| | BIOS | Award™ 4 Mbit Flash | |
| Memory | Technology | Dual-channel DDR2 533/400 SODIMM | |
| | Capacity | Up to 2 GB with 2 slots | |
| Expansion | Onboard Expansion Slot | One 32-bit/33 MHz Mini PCI slot | |
| Ethernet | Fast Ethernet | One 10/100 Intel® 82562 FE port for management | |
| | Gigabit Ethernet | Four 10/100/1000 Mbps GbE ports | |
| | GbE Controller | 4 x Intel® 82573 | |
| | LAN Bypass | Two segment on GbE ports | |
| Storage | SATA | Supports 2.5" HDD<br>Max. data transfer rate 150 MB/s | |
| | CompactFlash Socket | 1 CF socket on IDE 0 (Primary/Master) | |
| Peripheral | USB | 2 USB 2.0 | |
| | Serial | 1 RS-232 | |
| | K/B, Mouse, LPT, CRT, COM | Pin headers | |
| Power | Watts | 65 W | |
| | Input | 100 ~ 240 V AC, auto-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 | Dimensions (W x H x D) | 252 x 44 x 167 mm (9.9" x 1.7" x 6.6") | |
| | Weight | 1.2 kg (2.6 lb) | |

## Dimensions

Unit: mm




## Ordering Information

| Part Number | Processor | LAN | AC Adapter | Ethernet Controller |
|---|---|---|---|---|
| FWA-710E | - | 5 | 65 W | 4 x Intel® 82573 |

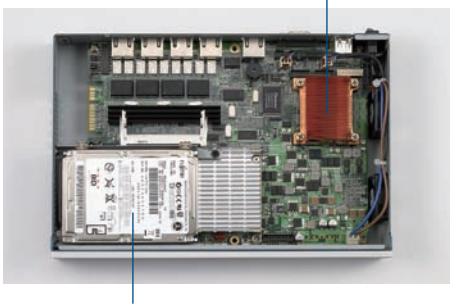
## Packing List

| Part Number | Description |
|---|---|
| 1701160101 | VGA port cable (for system installation use) |
| 1703092000 | Console cable d-sub 9-pin 2 m |

## Accessories

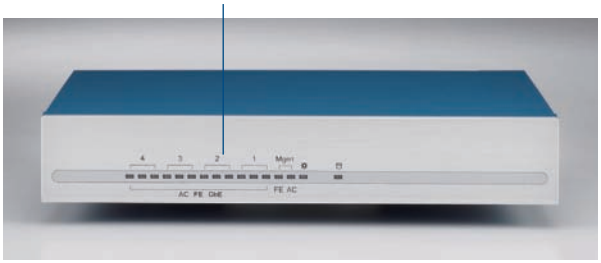
| Part Number | Description |
|---|---|
| 1700001947 | 2P 180 cm, USA |
| 1700001948 | 2P 180 cm, Europe |
| 1700001949 | 2P 180 cm, UK |
| 1700002141 | 2P 180 cm, JP |

Intel® Pentium M CPU



2.5" IDE HDD

Sixteen LED Indicators for Power, HDD and LAN status

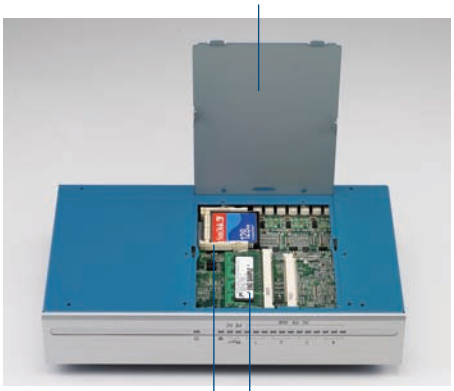


Two USB 2.0 ports RS-232 console port

Management LAN port

Four LAN ports

Removable cover allows easy maintenance and software upgrade



CompactFlash socket

SDRAM socket

# FWA-1204

## Tabletop Fanless Intel® based Platform with 4 GbE LAN Ports


## Features

- Tabletop fanless application platform
- Intel® EP80579 Integrated Processor solution
- Single channel DDR2 SODIMM support up to 2 GB
- 4 x 10/100/1000 Mbps GbE LAN ports
- Console port for local setting

## Introduction

The FWA-1204 incorporates Intel's System-on-Chip which combines Intel's QuickAssist Technology and integrates an Intel® Pentium M class Core, memory controller and I/O controller. The high-performance CPU Core supplies the horse power needed to perform deep packet inspection and other complex operations and is particularly optimized for entry level to mid-range network security appliances.

Security applications can run existing x86 software applications because of backward code compatibility with earlier Intel® processors. Most network security platforms already run on Intel® x86 processors and can run existing software applications on Intel® EP80579 integrated processor because it is backward compatible with earlier Intel® processors. Typical appliance workloads which require IP-SEC encryption, acceleration and compression of content can offload processing on to the QuickAssist Integrated Accelerator which increases the effective data throughput and performance and reduces the overall power consumption of a given application.

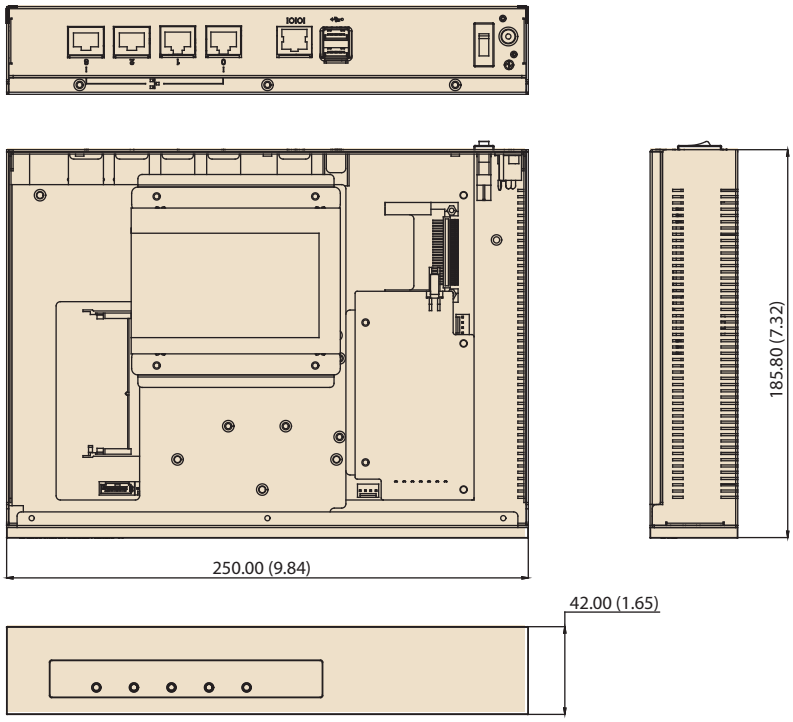
The FWA-1204 features a low-power design, and supports up to 2 GB DDR2 on one single-channel SODIMM. It provides a total of four GbE LANs, three of which are from the on-chip MACs and the fourth from a PCIe-based Intel® 82574 Ethernet controller. The on-chip MACs are routed to 3 Marvell PHY devices. The system supports one 2.5" SATA HDD and CompactFlash for OS and/or Internet security applications. The system is fully FCC, CE and RoHS compliant.

## Specifications

| | | | |
|---|---|---|---|
| Processor System | CPU & Chipset | Intel® EP80579 Integrated Processor supports 600 MHz processor | |
| | Max. Speed | 600 MHz/Embedded | |
| | Front Side Bus | 400/533 MHz | |
| | BIOS | Award™ 4 Mbit Flash | |
| Memory | Technology | Single channel DDR2 800/667/533/400 MHz SODIMM | |
| | Capacity | Up to 2 GB with 1 slot | |
| Ethernet | Interface | 4 x 10/100/1000 Mbps | |
| | Controller | Three GbE from Intel® EP80579 Integrated Processor + Marvell 88E1111 PHY<br>One GbE from Intel® 82574, with one segment LAN bypass | |
| Storage | SATA | 1 x 2.5" HDD bay<br>Max. data transfer rate at 150 MB/sec | |
| | Controller | JMicron (SATA to IDE bridge) | |
| | Compact Flash Socket | 1 x CF socket on IDE 0 (Primary) | |
| Peripheral | USB | 2 x USB 2.0 | |
| | Serial | 1 x RS-232 with RJ-45 connector | |
| Power | Watts | 65 W | |
| | Input | 90 ~ 246 V AC, auto 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 | Dimensions (W x H x D) | 250 x 42 x 185.8 mm (9.8" x 1.6" x 7.3") | |
| | Weight | 1.2 kg (2.6 lb) | |

## Dimensions

Unit: mm (inch)




## Ordering Information

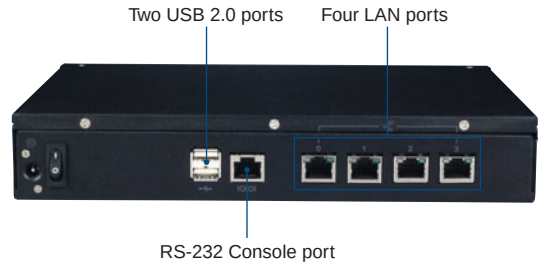
| Part number | Processor | LAN |
|---|---|---|
| FWA-1204E | 600 M/Embedded | 4 |

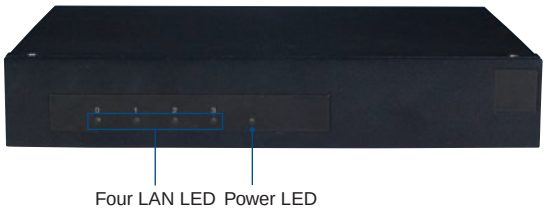
## Accessories

| P/N | Description |
|---|---|
| 1700001947 | 2P 180 cm, USA |
| 1700001948 | 2P 180 cm, Europe |
| 1700001949 | 2P 180 cm, JP |

## Packing List

| P/N | Description |
|---|---|
| 1700002270 | Console cable RJ-45 to D-Sub 9PIN 1.8 M |



# FWA-1305

## Tabletop Intel® Atom™ 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
- Two GbE LAN ports for Management
- Supports one fixed 2.5" SATA HDD

## Introduction

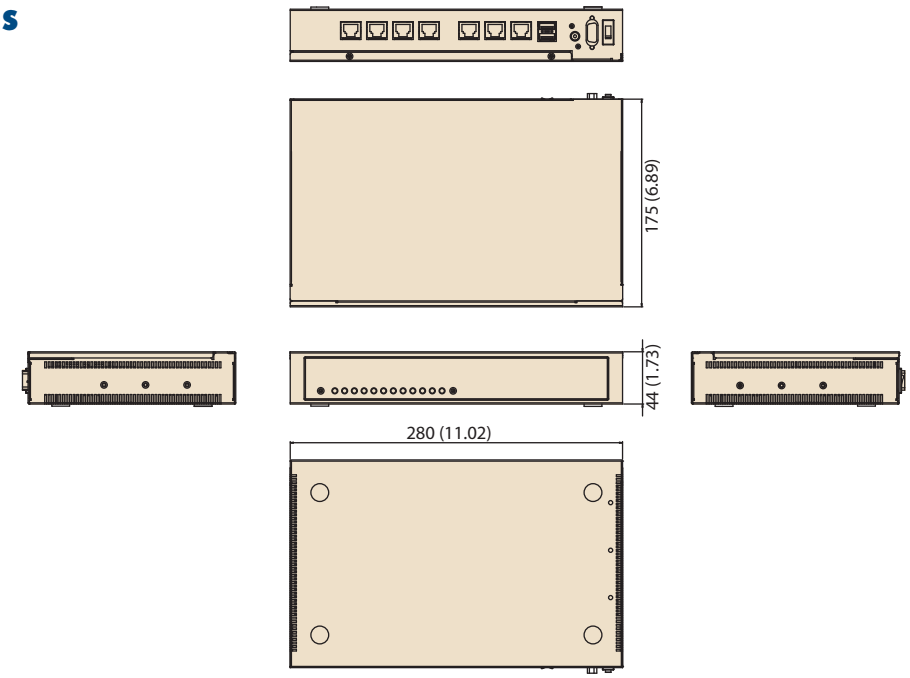
Conceived as a powerful but low power consumption Internet security platform, the FWA-1305 series was specifically designed for mainstream IDS/IPS, Anti-virus, VPN gateway and Unified Threat Management (UTM) applications. The FWA-1305 adopts the latest Intel® Atom™ processor and Intel® 82801HBM I/O Controller 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.

## Specifications

| | | | |
|---|---|---|---|
| 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 667/800 SODIMM | |
| | Capacity | Up to 4 G | |
| Ethernet | Gigabit Ethernet | 1 x 82567V GbE,1 x 82583V GbE<br>4 10/100/1000 Mbps PCIe GbE ports | |
| | GbE Controller | 4 x Intel® 82583V | |
| Storage | SATA | SATA connector x 3 on separate SATA channels<br>Max. data transfer rate 300 MB/s<br>Support 2.5" SATA HDD x 1 | |
| | CompactFlash Socket | 1 CF socket on IDE 0 (Primary/Master) | |
| Peripheral | USB | 2 (USB 2.0) | |
| | Serial | 1 (RJ45) | |
| | K/B, Mouse, LPT, CRT, COM | Pin Headers | |
| Power | Watt | 60 W | |
| | Input | 100 ~ 240 $V_{AC}$, auto 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) | 280 x 44 x 175 mm (11.02" x 1.73" x 6.89") | |
| | Weight | 1.5kg (3.5lb) | |

## Dimensions

Unit: mm (inch)




## Ordering Information

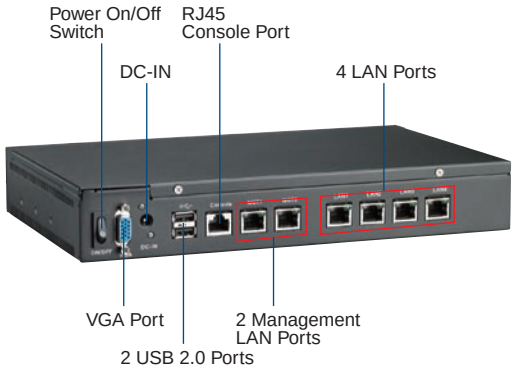
| Part Number | Processor | LAN | Power Supply |
|---|---|---|---|
| FWA-1305-00A1E | D410 | 6 | 12V/5A, 60W |
| FWA-1305-01A1E | D510 | 6 | 12V/5A, 60W |

## 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 |

## Accessories

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



# Global Access, Local Support


## Regional Service & Customization Centers

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **China** | Kunshan<br>86-512-5777-5666 | **Taiwan** | Taipei<br>886-2-2792-7818 | **Netherlands** | Eindhoven<br>31-40-267-7000 | **Poland** | Warsaw<br>48-22-33-23-730 | **USA** | Milpitas, CA<br>1-408-519-3800 |

## Worldwide Offices

### *Greater China*

| | |
|---|---|
| ***China*** | 800-810-0345 |
| Beijing | 86-10-6298-4346 |
| Shanghai | 86-21-3632-1616 |
| Shenzhen | 86-755-8212-4222 |
| Chengdu | 86-28-8545-0198 |
| Hong Kong | 852-2720-5118 |
| ***Taiwan*** | 0800-777-111 |
| Taipei | 886-2-2792-7818 |
| Shing-Tien | 886-2-2218-4567 |
| Taichung | 886-4-2378-6250 |
| Kaohsiung | 886-7-229-3600 |
| HsinChu | 886-3-543-0569 |

### *Asia Pacific*

| | |
|---|---|
| ***Japan*** | 0800-500-1055 |
| Tokyo | 81-3-6802-1021 |
| Osaka | 81-6-6267-1887 |
| ***Korea*** | 080-363-9494 |
| Seoul | 82-2-3663-9494 |
| ***Singapore*** | 65-6442-1000 |
| ***Malaysia*** | 1800-88-1809 |
| Kuala Lumpur | 60-3-7724-3555 |
| Penang | 60-4-397-3788<br>60-4-397-4188 |
| ***India*** | 1800-425-5070 |
| Bangalore | 91-80-2337-4567 |
| ***Australia*** | 1300-308-531 |
| Melbourne | 61-3-9797-0100 |
| Sydney | 61-2-9482-2443 |
| ***Thailand*** | |
| Bangkok | 66-2-248-3140 |
| ***Indonesia*** | |
| Jakarta | 62-21-7690525 |

### *Europe*

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|---|---|
| ***Europe*** | 00800-2426-8080 |
| ***Germany*** | |
| München | 49-89-12599-0 |
| Düsseldorf | 49-211-97477-0 |
| ***France*** | |
| Paris | 33-1-4119-4666 |
| Grenoble | 33-4-7670-4700 |
| ***Italy*** | |
| Milano | 39-02-9544-961 |
| ***Benelux & Nordics*** | |
| Breda | 31-76-5233-100 |
| Roosendaal | 31-165-550-505 |
| ***UK*** | |
| Berkshire | 44-1344-381210 |
| ***Poland*** | |
| Warsaw | 48-22-33-23-740/741 |
| ***Russia*** | 8-800-555-01-50 |
| Moscow | 7-495-232-1692 |

### *Americas*

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|---|---|
| ***North America*** | 1-800-866-6008<br>1-888-576-9668 |
| Cincinnati | 1-513-142-8895 |
| Milpitas | 1-408-519-1788 |
| Irvine | 1-949-798-7178 |
| ***Brazil*** | 0800-770-5355 |
| Säude-São Paulo | 55-11-5592-5355 |

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