The World of Compact PCI 2007

Communications

Transportation

Industrial

Defense

Medical

Computer On Modules | Blades & Mezzanines | CPU Boards | Systems | Mobile Rugged | Custom Solutions

kontron

Embedded OEM Solutions

Kontron is one of the world's largest manufacturers of embedded computer technology and mobile rugged computers & displays to a diversified customer base in the communications, industrial control, test & measurement, medical, transportation, energy, point of information/ sale, infotainment, defense, and public safety markets. With its global corporate headquarters located in Europe and regional headquarters in North America and Asia, Kontron has established a strong presence worldwide. When it comes to embedded computing, you can focus on your core capabilities, and rely on Kontron as your global OEM partner for a successful long-term business relationship.

We offer you an extensive portfolio of products and services based on internationally accepted industry standards for hardware, software and connectivity. Solutions ranging from off-the-shelf to custom-engineered embedded computer modules, boards and blades to modular computer systems and application ready platforms, each designed to meet your current and future needs.

Over 2.400 employees worldwide are working to provide you with one of the widest range of products based on cutting-edge embedded computer technology. With engineering, manufacturing, integration, project management, technical services, and sales teams in Europe, Americas, and Asia-Pacific, we are close to you - wherever you are. Our superior value-add services and excellent technical support allows you to significantly reduce your time-to-market and gain a clear competitive edge.

More than 800 highly qualified engineers in R&D, technical support and project management work with our experienced sales teams and sales partners to devise a solution that meets your individual application's demands, based on standard products, custom-tailored or full custom-engineered solutions. We assist you in developing your embedded application, moving it from proprietary technology to solutions based on open-standard platforms.

Kontron has established dedicated global business units to provide application-ready OEM platforms for specific markets: such as Medical, Industrial Control, Communications, Transportation, Energy and Defense & Security.

Kontron products are the preferred choice for any application that requires long-life, high-performance and cost-effective products to be installed in demanding and mission-critical environments.

Kontron has advanced testing and manufacturing facilities that are ISO 9001 and ATEX-certified to ensure consistency and the highest level of quality in products and services on a global basis.

In 2006, VDC awarded Kontron the 3rd year in a row „**Platinum**" **vendor** status for „**Embedded Computer Boards**", based on a global customer survey.

MEMBER
OF THE
YEAR
2006

Kontron - A Global Company

Bringing new applications to market first

Kontron helps leading OEMs and systems integra-tors significantly reduce their time-to-market and gain a competitive edge. Kontron designs and manufactures innovative building blocks capable of supporting numerous applications for today's networked infrastructure. Our broad portfolio of products includes all major form fac-tors and platforms from computer-on-modules (COMs), boards/blades, SBCs, open-platform communications servers, industrial-grade rack-mount and Box-PC solutions, Human-Machine Interface (HMI) systems up to mobile rugged displays and workstations and application ready platforms. We also offer a host of embedded hardware as well as application specific technol-ogy and custom engineered solutions.

Providing custom design and integration

While Kontron's wide array of standard product designs offer options that can satisfy the re-quirements of most applications, we also provide in-depth design support for custom tailoring of products to meet specific application require-ments that are unique to our customers' environ-ments.

Delivering global service & support

Our R&D, manufacturing and sales & support fa-cilities are located across Europe, the Americas, and the Asia-Pacific region. Support expertise and technical knowledge is located right where our customers need it – not many time zones away at a distant factory.

Kontron retains an experienced staff of highly knowledgeable sales and technical personnel and our pre- and post-sales support is unparalleled in the industry. When you call Kontron for tech-nical support, you will have an application engin-eer on the line with you from start to finish. Kontron is committed to providing real-time, customer-focused support, whether you are cal-ling to see how we can best meet your applica-tion needs or for trouble-shooting assistance.

Strategic Partners / Memberships

MEMBER OF THE YEAR 2006

Together with our major industry partners, such as Intel®, Freescale, Microsoft and WIND RIVER, we are working to reduce the time-to-market for our OEM customers. Kontron is a Premier member of the Intel® Communications Alliance (ICA) and was awarded Member of the Year 2006.

Close relationships with our strategic partners allow us the earliest access to cutting-edge technologies and enables us to solve customer problems efficiently and quickly.

Through our strategic memberships, we drive new technologies to ensure Kontron is able to offer OEM solutions based on open-standards for today's markets and for future-oriented applications.

Kontron CompactPCI Advantages

The requirements are obvious
System designers for OEM applications
should consider the following:

➤ Time-to-market for new products
➤ High-reliability, low-cost components
➤ Long-term component availability
➤ Off-the-shelf software support
➤ Standards-based hardware and software

Today's requirement on industrial PC technol-
ogy is far more than standard motherboard
technology can offer. Those designs are opti-
mized for production cost, and exclude factors
such as longevity. In most cases they fall short
when it comes to solutions for intelligent
cabling, EMI shielding or optimized cooling.

CompactPCI provides the answer
Industrial PCs traditionally focus on improved
mechanics to overcome the limitations posed
by the standard PC set-up. This changed dra-
matically with the invention of CompactPCI,
the fully industrialized version of desktop PC
technology. In the past, price played a very
important role when deciding to invest in a
PC-based system.

Today price still plays a decisive role, but
experience shows us that the ultimate deciding
factors are the availability of off-the-shelf
standard software and the low MTTR (Mean-
Time to Repair) connected with CompactPCI
based technology.

CompactPCI provides solutions for high density
packaging, excellent EMI shielding, optimized
cooling and reliable, serviceable, robust and
high available systems. Kontron integrates all
of those characteristics into a wide offering
of CompactPCI products with advantageous
features:

➤ High-performance PCI bus (256 MByte/s
with up to 64 Bit data width)

➤ Up to 14 peripheral slots on a dual-
Compact-PCI system compared to 4 on
a standard motherboard industrial PCs

➤ Parallel card insertion from front for
easy replacement and minimum MTTR

➤ Proved 19" mechanics in 3U, 6U and
mixed configurations

➤ Rear I/O support option for internal
cabling requirements and hot swap

➤ Multi-processing with latest generation
PCI Bridge technology and a selection
of operating systems

➤ Improved airflow by consequent vertical
mounting of boards

➤ Hot swap hardware provision on high
reliable connector

powered by **Embedded**
Multi-Core Processor

PICMG

CP6012
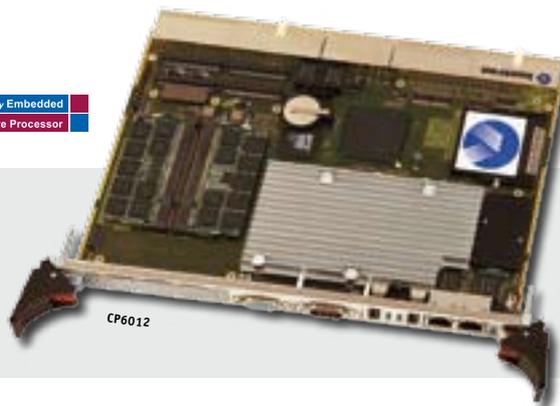
Robustness

The industrial stability of 19-inch technology and the Eurocard form factor make CompactPCI an outstanding technology. The combination of pin and socket connectors, card guides, and front panel retaining mechanisms results in superior support and ruggedness for all system boards. CompactPCI boards are inserted and removed from the front of the system without affecting rear I/O connections or neighbouring cards. These mechanical characteristics, combined with hot swap circuitry and management software, increase reliability and serviceability while paving the way for high availability systems.

Passive backplane

The active motherboard associated with today's PCs contains bundles of cabling and many active components that make the system impossible to service without shutting it down. Replacement can be time consuming and difficult and often requires dismantling of the system. CompactPCI hotswap capabilities allow for board changes without disconnecting the power and in the case of peripheral boards, without affecting the system's operation.

PICMG 2.16

Additionally, new switch-fabric architectures, such as the PICMG 2.16 packet switch backplane, increase systems reliability by eliminating single points of failure in board interconnectivity. PICMG is an extension of the PICMG 2.x family of specifications that implements a packet-based switching architecture (based on Ethernet) on top of CompactPCI.

Upgradability

As CPU technology improves, typically at a much faster rate than I/O subsystems, system controllers can be replaced without altering any existing I/O. Because CompactPCI is an industry-supported open standard, long-term functional replacements for system controllers and peripheral boards are readily available.

CP307

powered by Embedded
Multi-Core Processor

Thermal effects

Electronic devices generate significant amounts of heat that need to be dispersed to ensure product longevity. Uneven cooling can lead to poor performance and, ultimately, system failure. Warped PCBs, resulting in bad connections and broken traces, are one example of possible consequences of overheating. This is the typical scenario associated with commercial systems used in harsh environments. CompactPCI systems are designed with a clear, even passage of airflow over all heat-producing boards and devices. Such systems have forced cooling that guarantees a minimum level of airflow.

Kontron's extended temperature expertise

Computers used in an environment with changing ambient temperature need to withstand more heat and cold than office devices. In 1975, Kontron began designing industrial computers with versions for extended temperature ranges, supplying market segments where extended temperature resistance is needed such as transportation, unattended outdoor systems, mobile measurement systems and special vehicles. The standard temperature range for Kontron's CompactPCI products covers 0°C to +60°C. Additionally Kontron is able to provide CompactPCI products suitable for applications operating in the extended temperature range of -40°C to +85°C.

Kontron's system integration capabilities

Supplying high quality board products has helped to enhance Kontron's reputation. Kontron also has developed great capabilities in providing high-availability integrated solutions, not only with chassis designs but also through the development of IPMI firmware and system management software integration with Carrier Grade Linux in order to deliver complete systems for which only application software is needed.

For integration, Kontron can install the customer applications at its premises and go as far as drop shipping equipment for its customers on their behalf.

CompactPCI Performance Line

Features	CP6012 [64] new	CP6012	CP6000	CP6011	CP6010
CPU	Intel® Core™ 2 Duo Processor up to 2.16 GHz	Intel® Core™ Duo Processor up to 2.0 GHz	Intel® Pentium® M up to 1.8 GHz (745)	Intel® Pentium® M up to 2.0 GHz (760)	Dual LV Intel® Xeon® up to 2.4 GHz
Front Side Bus	667 MHz	667 MHz	400 MHz	400 MHz (533 MHz with 2.0 GHz Pentium® M)	400/533 MHz
CPU L2 Cache	4 MByte	2 MByte	2 MByte	up to 2 MByte	dual 512 kByte
Chipset	Intel® E7520 and 6300ESB I/O Controller Hub	Intel® E7520 and 6300ESB I/O Controller Hub	Intel® 855GME and 6300ESB I/O Controller Hub	Intel® E7501 + ICH3-S	Serverworks GC-LE
DRAM	up to 4 GByte with ECC, DDR2 400	up to 4 GByte with ECC, DDR2 400	up to 2 GByte with ECC, DDR 333	up to 2 GByte with ECC, PC1600 DDR SDRAM	up to 8 GByte PC 2100 DDR, ECC
Flash	CompactFlash	CompactFlash	CompactFlash	CompactFlash	CompactFlash
Frontpanel	VGA (CRT), COM1, 2x Ethernet, 1x USB, LEDs, Reset, PMC/XMC	VGA (CRT), COM1, 2x Ethernet, 1x USB, LEDs, Reset, PMC/XMC	VGA (CRT), COM1, 2x Ethernet, 1x USB, LEDs, Reset, PMC	1x COM, 1x Ethernet, LEDs, Reset, 2x PMC	VGA (CRT), COM1, 2x Ethernet, 1x USB, LEDs, Reset, PMC
USB	4x USB 2.0	4x USB 2.0	4x USB 2.0	3x USB 1.1	3x USB 1.1
Ethernet	4x Gigabit, 2x to front, 2x to rear, PICMG 2.16 compliant	4x Gigabit, 2x to front, 2x to rear, PICMG 2.16 compliant	4x Gigabit, 2x to front, 2x to rear, PICMG 2.16 compliant	2x Gigabit, 1x 10/100 Base-Tx, PICMG 2.16 compliant	2x 10Base-T/100Base-Tx/1000Base-T, PICMG 2.16 compliant
Graphics	ATI ES1000 (64 MByte video memory)	ATI ES1000 (64 MByte video memory)	855GME internal	ATI® Mobility-M (4 MByte video memory)	C&T 69030 (4 MByte)
PMC	1x slot PMC: 64 Bit/66 MHz or 1x slot XMC: x8 PCIExpress	1x slot PMC: 64 Bit/66 MHz or 1x slot XMC: x8 PCIExpress	1x slot PMC: 64 Bit/66 MHz	2x slots PMC: 1x 64 Bit/133 MHz, 1x 64 Bit/66 MHz	1x slot PMC: 64 Bit/66 MHz
System Peripheral	system/stand alone	system/stand alone	system/stand alone	Universal Bridge	Universal Bridge
Rear I/O	yes	yes	yes	yes	yes
IPMI	yes (IPMI V1.5)	yes (IPMI V1.5)	yes (IPMI V1.5)	yes (IPMI V1.5)	yes (IPMI V1.5)

Solutions using packet switched backplanes (PICMG 2.16) are tremendously efficient for Media/VoIP gateways, routing devices, storage area networks and clustering. CompactPCI has been well accepted in the comms industry, which also has supported the specification refinement process on industry-specific sub-specification such as the H. 110 bus TDM traffic support. Typical application areas within the communications field are found both in datacom, net management, routing or security systems, as well as in telecom/VoIP, telephony switches, IP PBXs, wireless base stations, signaling gateways, gateway controllers and softswitches.
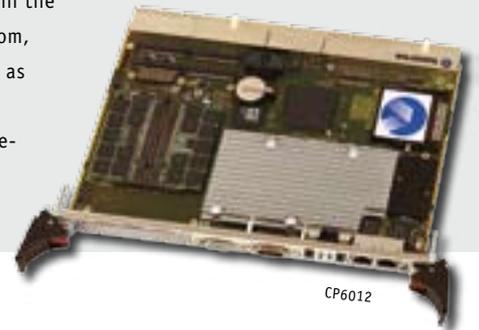
CP6012

PICMG 2.16

The continued ability of products to interoperate is essential to the timely development and evolution of systems in a changing world. The prime objective of a Packet Switched Backplane is to assure the Ethernet network interoperability between the blades and the switches even if they are from different vendors.

Kontron offers a variety of PICMG 2.16 compliant CPU blades such as the: CP6000, CP6010, CP6011, CP6012 and also Ethernet switches such as CP6920 or the latest CP6923.

Performance

Connectivity

Reliability

The use of high-performance components from Intel®'s Embedded Roadmap ensures the longest product lifespan possible. The CP6000, CP6011 with Intel® Pentium®-M 745 and the CP6012 with Intel® multi-core processors deliver power-packed performance that guarantees a presence in both today's and tomorrow's markets

A successful communications platform requires high-bandwidth connectivity throughout the system with no bottlenecks. The PICMG 2.16 provides Gigabit Ethernet channels via its Compact PCI backplane, thereby providing the optimal connectivity option.

CompactPCI systems are rendered fail-safe by simply adding backup boards (redundant technology). This is achieved via cable free expansion using the backplane. The scalability of CP6000, CP6011 and CP6012 delivers unlimited headroom for the future.

Intel® Core™ 2 Duo Processor...

More Performance per Watt

CompactPCI is high-end technology in the embedded computer technology sector. The latest Intel® Core™ 2 Duo processors currently offer the highest MIPS per Watt on the market today for embedded systems. The next step, without question is to integrate the latest Intel® Core™ 2 Duo processor technology into CompactPCI systems.

Intel® Core™ 2 Duo and Intel® Core™ Duo processors offer more performance per watt and consumes less energy enabling for more production at similar clock speeds. This was primary factor for making the initial switch from the Pentium® M to the Intel® Dual Core processor and is again for moving to the Intel® Core™ 2 Duo processor and its 64 bit architecture. The first users of Intel® Core™ 2 Duo technology will naturally be adopted in the high-end sector. Kontron has started integrating Multi-Core™ processors into suitable platforms, first and foremost CompactPCI.

The first CompactPCI CPU boards in 3U and 6U are equipped with the latest Intel® Core™ 2 Duo processor. However, to understand the full implications of 2.16 GHz on a Intel® Core™ 2 Duo processor, it's best to compare it with previous single and dual core processors.

Boards equipped with the 2 GHz Pentium® M, which has approximately the same speed as the 3.2 GHz Pentium® 4. When the switch to Intel®'s first Dual Core processor was made with the CP6012, we saw a great increase in performance and even more savings in power consumption. Well, Kontron has once again updated its CompactPCI line to include the CP6012[64], this system touts a processor that has seen an evolutionary upgrade to the Dual Core, with a doubled L2 Cache of 4 Mbytes and its new 64 bit capabilities. Kontron's initial tests have confirmed that the 2.16 GHz Intel® Core™ 2 Duo processor is almost equivalent to a 6.4 GHz Desktop processor (Pentium® 4, performance notionally adjusted 1:1). If we compare the Intel® Pentium® M 756 processor (2.1 GHz) with the Intel® Core™ 2 Duo processor (2.16 GHz), we can see that performance is enhanced at the same clock frequency and with standard Office applications:

In other words, performance is almost doubled at the same clock speed and with single-threaded software. In the future, performance can be expected to increase exponentially with multi-threaded software with VT. So, if you're wondering which processor to embed in your next system, the answer is most definitely an Intel® Core™ 2 Duo processor.

The new boards in detail

The new CP6012[64] (6U) and CP307[64] (3U) CompactPCI assemblies are equipped with the Intel® Core™ 2 Duo processors and with a 945GM or E7520 (6U CompactPCI) chipset. They offer 2.16 GHz at 31 W, 667 FSB and 4 MByte L2 Cache. As an alternative, the boards are also available with 1.5 GHz (LV) Intel® Core™ 2 Duo processor. In addition, to the being 64-bit, they both come equipped with several industry standard interfaces and are very scalable for future editions. Software support includes Linux, Windows XP, XP embedded and Windows Server.
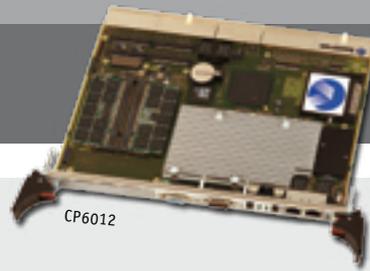
CP6012⁶⁴ Multi-Core on 6U CompactPCI

CP6012

The CP6012⁶⁴ uses scalable dual-core processors in combination with a server-class chipset that is designed for high performance and maximum data throughput. As the flagship for PICMG 2.16-compliant 6U CompactPCI systems, the CP6012⁶⁴ dazzles with its high level of integration and the latest interface technologies, including PCI Express onboard, up to 4 GByte DDR2 400 MHz RAM, and a high-speed serial ATA interface, and an onboard hard disk. The feature set is topped off with four 1 GBit Ethernet interfaces (two at the back/two at the front) and max. 4x USB, 1x COM and VGA and rear I/O support.

Customer-specific add-ons are possible with an XMC slot (PCIe x8 (!)) or, alternatively, a PMC slot for mezzanine cards. Software support is offered for Linux (SuSE 9.3 or 10.0 and RedHAT Enterprise 4.0) and for Windows XP, XP embedded and Windows Server.
The CP6012⁶⁴ is being upgraded this year to be equipped with the newly released Intel® Core™2 Duo processor with 64 bit technology. This product is an excellent choice for its increased performance and equivalent power consumption as previous processors. Kontron is well known for developing systems that meet the highest per-

formance standards and continues to uphold that with the use of the latest processor technology. What makes the Intel Core™2 Duo processor unique is its integrated 64 bit support and server quality data throughput. It is able to accomplish this with additions such as a 4 MByte L2 cache and 400 MHz DDR2 memory. Kontron is not leaving anything to chance with so many connections being available. Some of which include 2x SATA interfaces, 4x USB 2.0, 2x Com and VGA, as well as rear I/O support. These are just a few of the technical reasons that make the new CP6012⁶⁴ a winner.

3U CP307 with Multi-Core™ power

The 3U CompactPCI CP307⁶⁴ board with a dual core processor is ideal for applications used in rugged environments. While the CP6012 is designed for maximum data throughput, the CP307⁶⁴ in the compact 3U format is designed to optimize the relationship between high performance and robust design. The processor and 2 GByte of the memory (max. 4 GByte) are soldered onto the board. High data throughput is also guaranteed by the high-speed memory access of 667 MHz, PCI-Express onboard, and serial ATA support. DVI and VGA in the dual-monitor setup, 2 GBit Ethernet interfaces, up to 6x USB ports, and an extensive range of I/O interfaces (inclu-

ding rear I/O access) finish off the feature set. Kontron is now introducing the latest CP307⁶⁴ successor based on Intel® Core™2 Duo processor with 64 bit technology. The Intel Core™2 Duo processor is an excellent addition to Kontron's product line because of its excellent power savings and increased performance. Other additions include Intel®'s Mobile 945GM chipset and doubling of its L2 cache to a size of 4 Mbytes. This is just another example of how Kontron is staying on the forefront of technological improvements and offering these options to its customers. The CP307⁶⁴ is a great leap in technology and will be available in speeds of 1.5 GHz or 2.16 GHz with a 667 FSB.

The 64 bit architecture is a terrific choice for situations that require substantial multi-processing. This CP307⁶⁴ is designed for the most rugged environments with both the processor and storage being soldered to the board to withstand whatever is thrown at it. Some extra technical specs that will accompany the processor include 4x SATA-interfaces, 2x GBit ethernet, 10.6 GBit data throughput and extensive communication interfaces.

CP307

CompactPCI Performance Line

3U Performance Line Processor Boards

Features	CP307[64]	CP307	CP306
CPU	Intel® Core™ 2 Duo Processor up to 2.16 GHz	Intel® Core™ Duo Processor up to 2.0 GHz	Intel® Pentium® M up to 1.8 GHz (745)
CPU L2 Cache	4 MByte	2 MByte	up to 2 MByte
Chipset	Intel® 945GM and ICH7-R	Intel® 945GM and ICH7-R	Intel® 855GME and ICH4
DRAM	Max 4 GByte, (2 GByte soldered + 2 GByte via SO-DIMM socket)	Max 4 GByte, (2 GByte soldered + 2 GByte via SO-DIMM socket)	1 GByte with ECC soldered
DRAM speed	667 MHz	667 MHz	333 MHz
Flash Disk	CompactFlash socket	CompactFlash socket	CompactFlash socket
4HP Version	2x Ethernet, CRT, 2x USB 2.0, LEDs	2x Ethernet, CRT, 2x USB 2.0, LEDs	2x Ethernet, CRT, 2x USB 2.0, LEDs
8HP Version	DVI, COM1, 2x USB 2.0, PS/2, Reset, HDD Carrier	DVI, COM1, 2x USB 2.0, PS/2, Reset, HDD Carrier	COM1/2, PS/2, Reset, HDD Carrier
Ethernet	2x 1000Base-Tx	2x 1000Base-Tx	1x 1000Base-Tx, 1x 100Base-Tx
Graphics	945GM internal	945GM internal	855GME internal
Characteristics	Highest Performance, Rugged	Highest Performance, Rugged	High Performance, Low Power, Rugged
Power Consumption (typ.)	26 W / 1.5 GHz LV	23 W / 1.66 GHz LV	22 W / 1.8 GHz, 13 W / 1.4 GHz

Mezzanines

Kontron offers a set of mezzanine boards that can extend the CPU board capabilities by adding a hard drive, floppy or PCI bridge that can drive an additional PCI segment in some Kontron systems. Some are available for both 4HP and 8HP boards.
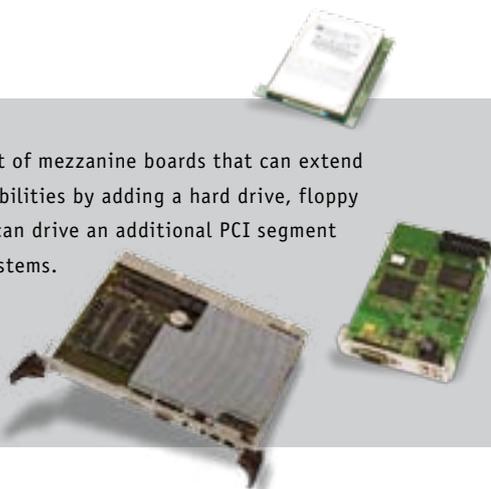
Rear Transition Modules

All of Kontron's CompactPCI CPU boards can be used with Rear Transition Modules (RTM) to access the boards' I/O from the back of the system, therefore easing the system's serviceability (with no cables plugged to the boards). RTMs can interface to I/Os such as VGA, serial ports, Ethernet ports, SCSI, USB, keyboard/ mouse, IDE, floppy, and others.
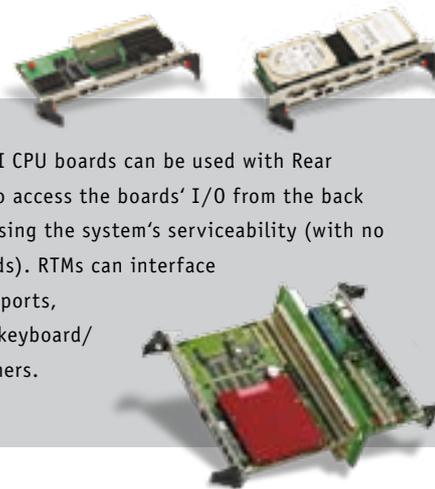
Kontron has long provided military and aero-space customers with reliable products that continue to work under extreme temperatures and high levels of physical stress. For com-munications systems on the ground, in-flight systems for civil or military aircrafts, the requirements must be met without compromise. Commercial in-flight entertainment systems, military flight combat simulators, and onboard vehicle systems are examples of CompactPCI uses in these markets.

Power PC Advantage

The PowerPC Architecture provides a complete foundation for today's computing applications, with all the necessary building blocks to bring future products to market. Since the architecture is scaleable, it is also a powerful, flexible and cost-effective choice for a variety of embedded control applications. From the very beginning, the PowerPC architecture has been a highly man-aged architecture, meaning it's well defined and very consistent throughout the entire line of pro-ducts, from the first discrete PowerPC processors operating at just 66 MHz to the latest, more inte-grated solutions that speed well past 1 GHz. This continuity of architectural development has been a tremendous advantage for developers. They know their investments in PowerPC processor-based products are both backward- and forward-compatible, and they can take advantage of future generations of PowerPC platforms without worrying about having to reinvent the wheel. And with planned introductions of more powerful and capable PowerPC cores and platforms on the horizon, including multiprocessing and 32- and 64-bit SoC platforms, the future is that much closer. In parallel with PowerPC core development, a reusable functional block portfolio includes: the latest networking interfaces, external buses, system fabrics, memory controllers, general com-munications peripherals and security engines. This block portfolio was continually expanded, to ensure optimal PowerPC SoC platforms are there when new applications and emerging technologies enter the marketplace to address customer needs.

PowerPC Processor Boards

CP321

➤ MPC8245 processor @ 330 MHz
➤ 64 bit CompactPCI interface
➤ Up to 256 MByte SDRAM with ECC @ 133 MHz
➤ Fast-Ethernet 10/100base-TX interface

➤ RS232 and optoisolated RS485 or 2x RS232
➤ Two sockets for Flash / NV-SRAM
➤ 8 MByte soldered Flash memory
➤ Extended temperature range -40 to +85°C (optional)

CP620

➤ IBM 750CX(E) 400 / 600 MHz
➤ PICMG 2.16 (Ethernet on backplane) compliant
➤ Up to 1 GByte SDRAM with ECC
➤ 4/8 Mbyte soldered Flash memory
➤ Two Fast Ethernet ports, one/four serial interfaces w. Rear I/O support
➤ Two PMC sockets with Rear I/O support
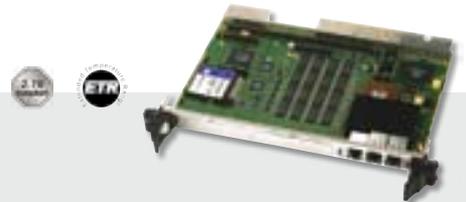
Meeting the Performance Needs

The Issue –
Improving Breast Cancer Diagnosis
The medical industry is continually searching for ways to improve the accuracy of breast cancer screening procedures.

One company seeking to make an impact on breast cancer detection is TechniScan Medical Systems. TechniScan is engaged in the development and commercialization of a revolutionary ultrasound imaging system, known as the Ultra-Sound CT™, with ultrasound technology that uses both speed of sound and attenuation measurements to develop a 3D type image. The goal is to develop a scanning system to differentially characterize amongst normal, benign, and malignant tissue.

The Application –
3D Ultrasound CT™ Imaging System
TechniScan's UltraSound CT system is designed to provide physicians with a new, non-invasive, diagnostic imaging tool that may provide detailed information about the anatomy (i.e. phy-

sical structures within the breast) and pathology (i.e. bulk tissue properties) of the breast. Unlike conventional breast ultrasound which measures the echo of sound waves as they reflect off tissue to produce images, UltraSound CT uses transmission ultrasound to produce two unique sets of images; one based on the speed of sound and one based on the attenuation of sound. The images from these two different measurements can be displayed in many orientations for review by a radiologist.

Another key benefit of the UltraSound CT system is its ability to scan the whole breast, allowing the radiologist to more easily localize and characterize areas of interest that have been identified by clinical exam or by mammography. As a result, TechniScan hopes to reduce the need for invasive, painful biopsies.

Technology Challenges
Although TechniScan's own optimization efforts enabled them to reduce the time needed for the patient to lie still for the scan (less than 10 minutes), this application requires an immense amount of computational power to process the huge amount of data quickly - a typical scan of each breast can generate about 30 gigabytes (GB) of raw data, or 60 GByte total per patient. Transforming that data into the final 16 MByte 3D image requires a very compute-intensive algorithm.

In order to be successfully commercialized, the performance of the system needed to satisfy the needs of its health care provider customers. Industry expectation is to be able to review images with the patient immediately after the exam. Because image processing begins at the start of the exam, the initial goal is to produce complete images in less than 60 minutes.

TechniScan's seven-node Linux cluster built with Kontron CP6011 single board computers (featuring a 1.8 GHz Intel® Pentium® M processor with 2 GByte of memory) connected by a fiber channel host adapter to a 2 terabyte RAID data storage system, the image processing time on this system was about 2.5 hours per breast. This was fast enough for a proof-of-concept demonstration, but not fast enough to be commercially viable. After extensive investigation, it was determined that the system was limited by the computing capabilities of the microprocessors.

Achieving Increased Performance with Multi-Core Architecture
To substantially decrease their image processing performance time, TechniScan engineers made changes to the algorithm and turned to Intel® software tools to help reduce the calculation time.

Once they reached the limits of those tools, TechniScan looked to Kontron and Intel® to find a more powerful processing platform to achieve their goal.

After analyzing the design challenges, a multi-core platform was selected to deliver the performance needed. Intel®'s 65 nm process technology makes it possible to integrate two cores in one physical package. Intel®'s platform approach to development combines a multi-core architecture and complementary system-enhancing technologies to deliver scalable, energy-efficient processing. The Intel® Core™ Duo processor delivers nearly twice the performance as the previous Intel® Pentium® M 756, while consuming the same amount of power.

To meet the requirement of the TechniScan UltraSound CT application, Kontron built the CP6012 single board computer using a single Intel® Core™ Duo processor T2500 at 2 GHz with 2 GByte of system memory. This increased the number of total processing cores from seven to 14, providing the necessary boost in performance that TechniScan was seeking. The initial results are encouraging and show that with Kontron's T7400-based CP6012, TechniScan should be able to achieve their initial goal of delivering images in less than 60 minutes.

TechniScan UltraSound CT Breast Imaging System in the Real World

TechniScan is still working to ensure that its 3D Ultrasound CT Breast Imaging System can perform in the real world as it does in the test environment. Kontron and Intel® are continuing to work with them to ensure that the performance will stand up to the rigors of the daily environment it will be used.

For now, the final decision on the efficacy of this new diagnostic tool is being evaluated in clinical trials and will ultimately be reviewed for clearance by the FDA.

TechniScan, Intel® and Kontron Collaborative Efforts

One of the key values that technology vendors can provide is to create a flexible technology solution that can react to changes in demands. TechniScan turned to Kontron to not only provide a solution that offered maximum computing power, but that was compatible with the other required components yet flexible enough to be adapted to meet evolving market needs and sustainable over time.

By utilizing the latest advanced technologies based on open standards and working in close collaboration, Kontron and Intel® were able to help TechniScan deliver an application that could revolutionize breast cancer detection. Further technical information on the CP6012 please see page 7ff.

For a full version of the TechniScan Case Study please visit: **www.kontron.com/techniscan**
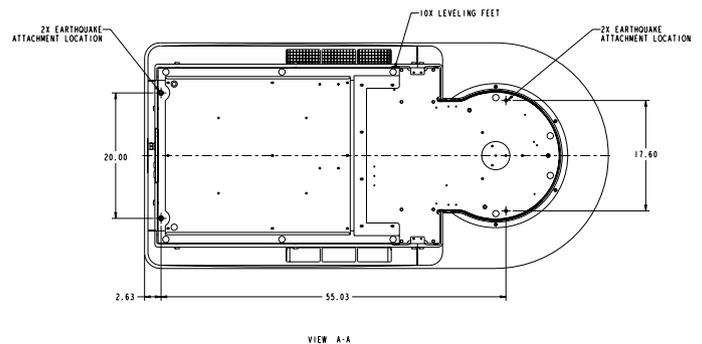
CompactPCI Switch and Systems

CompactPCI FlexiSwitch leverages installed base of VoIP and Media Gateways

Voice over IP installations now have become main stream in enterprise networks and already have a significant installed base in carrier networks. Early deployments started 8 years ago, with CPCI being an indispensable technology in existing installations. CPCI now is the leading technology used in Call Servers, Media Servers and Media Gateways. Call Servers keep track of call states and session states. Media streams are handles by Media Servers and Trunking Gateways. Trunking Gateways provide the transitions to traditional POTS networks (PSTN) and 2G mobile networks (PLMN). Media Gateways provide support for handling call sessions by announcements, conference facilities, voice mailboxes, or IVR for user guidance. As shown in Figure 1, both Media Gateways and Trunking Gateways are controlled by Call Servers. An emerging trend in VoIP and media processing is the handling of different classes of services. Different classes correspond to different qualities of service (QoS). Both support and management of QoS also generate higher requirements on processing of transactions and traffic and needs QoS enabled infrastructure.

How to extend the capacity for transactions and traffic load

While most systems are well prepared for capacity extensions, the switching fabric itself may become a headache. Individual switches need extra space and extra patchwork. They also poorly integrate into the system and into system management. Patch cables are error prone and missing integration into system administration may jeopardise carrier grade installations.

Also, the traffic needs to be distributed within the shelf to the processing units in an efficient way. Exterior switches cannot handle this situation. Also, such a solution hardly is cost effective. A high performance CPCI switch may overcome those problems.

A build-in high-performance CPCI switch for Call Servers, Media Servers and Gateways can provide:
➤ seamless integration into the shelf and into shelf management by IPMI
➤ hot swap capabilities
➤ flexibility to adjust to the individual requirements of the installation
➤ increase of capacity within the shelf over native CPCI connections
➤ latest technology in layer 2 and layer 3 switching and routing
➤ high capacity uplinks to the exterior world (10 GbE)
➤ the most cost effective solution.

One of the latest developments in high-performance switches is the CP6923. It incorporates the latest technology in switching, which is now also available on CPCI. The CP6923 Flexi-Switch is a PICMG 2.16 compliant 6U CPCI Gigabit Ethernet switch with 24 channels. It provides leading edge technology to CPCI installations, thus maximising their usage and life-time. A value line version provides basic layer 3 switching. The performance line provides non-blocking layer 3 switching and routing with two 10 GbE uplink ports.

A practical case

The CP6923 is compliant to PICMG 2.0 R3.0 specifications, PICMG 2.1 R.2.0 hot swap specifications, PICMG 2.9 R1.0 system management, PICMG 2.16 R1.0 packet switching backplane, IPMI specification V1.5, IEEE 802.3, 2000 and IEEE 802.3ae. It contains a 24 port GbE layer 3 switch with 19 link ports to CPCI boards and 1 link port to second fabric boards (all ports 10/100/1000Base-T).

Media Servers
➤ announcements
➤ customised tunes
➤ conferences
➤ voice mail
➤ streaming media
➤ trunking gateways

Media Server

Trunking GW

PSTN

IP Network (Carrier)

Call Server

PLMN

Trunking GW

Call Server
➤ session states
➤ SIP control
➤ H.323 control
➤ MGCP/Megaco

2.16 Chassis

Each **Node** slot contains one or two Link Ports (physical connections) back to the **Fabric** Slots(s)

N N N N N N | F | F

Fabric a

Fabric b

CompactPCI Packet Switched Backplane

CP-ASM10-PSB

Concerning uplinks, it supports
- ➤ 4 uplinks GbE (10/100/1000Base-T copper based) on the CP6923-C
- ➤ 4 uplinks 1GbE SFB on the CP6923-O
- ➤ 2 uplinks 10GbE XFP on the CP6923-O.

The CP6923 includes a fully managed software environment and a comprehensive firmware package. It contains:
- ➤ Board level management according to IPMI V1.5
- ➤ Reliable field upgrades for all software components
- ➤ Dual boot images with roll-back capabilities
- ➤ Management via SNMP with standard MIBs and command line interface
- ➤ System Access via Telnet, SSH and serial line
- ➤ Hot-Swap support
- ➤ Reset of basic fabric
- ➤ Integrated IP-Router on base fabric
- ➤ Modular software architecture for project specific customisation.

The Ethernet implementation supports QoS (IEEE 802.1p) on all ports, as well as VLAN including VLAN registration with GARP/GVRP (IEEE 802.1q). The routing capabilities also support DiffServ standards and redundancy of the routing functionality using a second switch hub board. The services include onboard event management, test and trace facilities, power on the shelf diagnostics and the persistent storage of configuration across restarts. They also support the retrieving and installing of multiple configurations. The CP6923 is positioned as a high-end solution with superior features combined with low costs.

Powerful
With the power of up to four power supplies of 250 watts each it is a joy to every system designer to be able to provide his application with a full-power platform to meet the demands of the growing power consumption of modern CPU and DSP blades. To dissipate all of this power the CP-ASM10-PSB is equipped with three hot swappable fans each with 294 m³/h or 173 CFM. This provides the platform with an average airflow of 3 m/s or 590 LFM.This platform is therefore very well suited for providing power to multiple CPU blades such as Kontron's CP605, CP6000, CP6010 and CP6011.

Scalable
To achieve the utmost versatility using the CP-ASM10-PSB, the integrated backplane provides four power connectors, two PICMG 2.16 compliant Ethernet switch slots, two 7 slot CPCI segments each with two nodes and also a Chassis Monitor Slot. With the diversity of these features it is the ideal platform for developing and deploying your application.

Manageable
With the possibility to monitor several functions such as voltages, fan speed and temperature, the platform is able to transmit an alarm signal to the system manager, when predefined tolerances are exceeded.

The function of the Chassis Monitor Module in detail is monitoring the system voltages continuously for exceeding the defined tolerances. Up to seven temperature sensors can be connected to the CP3-CMM1. There are 16 digital inputs. Some of them are used for power-good signals from the PSU's, shelf addressing and master slave position. The rest can be used for customized applications. Ten digital outputs are available for customized applications. The temperature and fan speed values from the Fan Control Module are transferred to the CP3-CMM1.

Kontron's CP-ASM10-PSB is a 19" rackmount CompactPCI platform, utilizing state-of-the-art technology and offering unparalleled versatility. Datacom, Internet infrastructure, computer telephony, and convergence markets have influenced new technologies such as the PICMG 2.16 specification. The CP-ASM10-PSB has been designed to meet the need for reliable and affordable CompactPCI platforms in these markets.

PICMG 2.16

The continued ability of products to interoperate is essential to the timely development and evolution of systems in a changing world. The prime objective of a Packet Switched Backplane is to assure the Ethernet network interoperability between the blades and the switches even if they are from different vendors. Kontron offers a variety of PICMG 2.16 compliant CPU blades like the CP605, CP6000, CP6010, CP6011 and CP6012 and also Ethernet switches such as CP6920 or CP944.

CompactPCI Systems

When it comes to offering a complete server solution, the key factors to look for are always the same – Reliability, Availability, Scalability and Manageability (RASM). As 'traditional' and 'embedded' IT converge, these four qualities become all the more relevant for the various embedded systems that combine to form complex architectures. And the one technology that guarantees these four qualities is now the same: Intelligent Platform Management Interface (IPMI).

IPMI - a few basics

IPMI describes both the physical interface, the Intelligent Platform Management Bus (IPMB) and the actual interface, that is, the IPMI messages for communication. The interface is what interacts with the system management software, which can run locally or remotely. The information from the different parts of the system is gathered here and passed 'up'. The IPMB communicates between the internal components (CPU board, power supply unit, fan and extension modules in a system). Physically, it is designed as an I²C bus.

The IPMI's technical base is made up of separate microcontrollers that equip the CPU boards, periphery cards and power supply units. The IPMI controllers work entirely independently of their symbiotic 'host components', and have a separate electricity supply and communicate using a separate bus. This segregation between the system management and the actual application boosts reliability and performance, because the main processor does not have to handle the system

management tasks. This also ensures that the IPMI will continue to work during a system failure.

We distinguish between two different working modes of IPMI firmware: Satellite Controller and Baseboard Management Controller (BMC). A satellite implementation represents a 'passive operation mode', the IPMI controller only communicates via the IPMB and reacts to queries sent from a monitoring IPMI unit. A BMC, on the other hand, can also monitor other IPMI components via IPMB and store IPMI information in a local repository.

IPMI in action - real world applications

Today we usually speak of 99.999 % or '5 Nines', which corresponds to an average downtime of around five minutes per year, and the new target is already '6 Nines' – only half a minute per year (or 0.5256 minutes to be precise). For process-critical plants, a brief failure can quickly destroy production batches to the value of a few million euro/dollars. Likewise, complex network node points which cannot be bypassed, or with telecommunications exchange systems where a fault will cut off thousands of customers in mid-sentence and imped sales because services could not be provided. These are by no means merely 'nice-to-have' values – they are prerequisites for a sustainable, profitable business; and, this is not to mention systems where a failure could put people's lives in danger, such as with power station management systems, traffic control systems and many other

applications that are prime target applications for IPMI.

Kontron IPMI Systems for OEM, VAR, and End-Users

As a market leader in the area of Embedded Computer Technology, Kontron offers a full range of boards and systems with IPMI that meet the PICMG 2.9 standard. Kontron systems are designed to remain available for a long time, and can be delivered as fully tested and independently certified hardware platforms. In addition, the time-to-market is reduced by integrating the CompactPCI platform into the overall solution, which Kontron also actively supports. In keeping with the trend towards outsourcing, Kontron offers an OEM integration service, which includes both the BIOS and driver programming for common operating systems such as Windows Derivate, VxWorks and Linux. Further services include the development of customer-specific hardware solutions, and application integration, including the provision of industry-standard certifications. There are over 400 developers available worldwide for this, in individual competence centers. The individual system components are of course also available for purchase for system integrators.
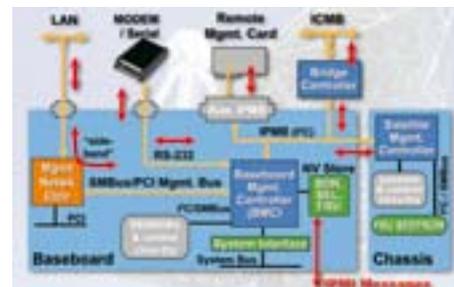
Performance Line Platforms

Platforms

CP-ASM4-Pocket

➤ Format: 4U / 28 HP / 4 slot
➤ Depth: 210 mm
➤ 19" Rack mounting / Wall Mount
➤ Power supply options: 75 W AC or DC

CP-ASM3-P47

➤ EMI protected
   (IEEE1011.10, IEC 1587 V1)
➤ Anodized/chromed aluminum
➤ Wall or cabinet mountable

➤ 3 cooling fans built into
   4U enclosure
➤ Built-in 4-11 slot backplane

PSB Platforms

CP-ASM6-PSB

➤ PICMG 2.16-compliant packet switching backplane
➤ Two H110 telephony busses six slot each
➤ Three redundant hot-swap power supplies
➤ Three redundant hot-swap power supplies
➤ Three hot-swap 150 CFM fans

CP-ASM10-PSB

➤ High power hot swap fans
   with 3 m/s (average)
➤ up to 4 power supplies (1000 Watt)
➤ 14 node slots within two
   7 slot CPCI segments

➤ 2 switch slots for
   Gigabit Ethernet Switches
➤ (redundant)
   Chassis Monitoring board

Standard Platforms

XL2000

➤ Format: 7U / 28 HP / 4 slot
➤ Depth: 210 mm
➤ 19" Rack mounting / Wall Mount
➤ Power supply options: 75 W AC or DC

XL1000

➤ Intended for rugged and cost effective solutions
➤ Efficient side-to-side cooling
➤ 250 W Power Supplies (load sharing and hot swappable)
➤ PICMG 2.16 and H110 support

CP-ASM6-P47

➤ EMI protected (IEEE1011.10, IEC 1587 V1)
➤ Built-in 8 slot backplane with hot-swap support
➤ Redundant AC or DC power supplies
➤ On all slots Rear I/O

CompactPCI Value Line

3U / 6U Systems

CP-Pocket

➤ 400 MHz Celeron up to 1.3 GHz Celeron processor
➤ Slim design
➤ 3 free slots
➤ Fanless (with 400 MHz)
➤ AC or 24/48 V DC versions available

XL-POCKET

➤ Slim design with 28HP / 7U / 210 mm
➤ Efficient off the shelf components
➤ Integrated CP6500-V with Celeron III
➤ 400 MHz or CP6000-V with 600 MHz Celeron-M
➤ 20 ... 60 V DC or 100 ... 260 V AC input Voltage

3U / 6U Processor Boards available Q2/2007 **new**

Features	CP307-V	CP306-V	CP303-V	CP6000-V
CPU	Intel® Celeron® M 1.86 GHz (Intel® Core™ Solo processor)	Intel® Celeron® M 1.3 GHz	Intel® LV Celeron® microBGA 400 MHz	Intel® Celeron® M 600 MHz
Front Side Bus	533 MHz	400 MHz	133 MHz	400 MHz
CPU L2 Cache	1 MByte	512 kByte	256 kByte	512 kByte
Chipset	Intel® 945GM and ICH7-R	Intel® 855GME and ICH4	Intel® 82815GMCH and 82801 ICH2	Intel® 855GME and 6300ESB I/O Controller Hub
DRAM	up to 2 GByte SO-DIMM DDR2	up to 1 GByte SO-DIMM DDR	up to 512 MByte SO-DIMM	up to 1 GByte SO-DIMM DDR
DRAM speed	533 MHz	333 MHz	133 MHz	333 MHz
CompactFlash	Onboard	Front panel	Onboard	Onboard
4HP Version	-	1x Ethernet, CRT/DVI, PS/2, 1x USB 2.0, LEDS	1x Ethernet, 2x USB, LEDs, CRT or COM1	2x Ethernet, 1x USB, LEDs, CRT, COM1, PMC
8HP Version	2x Ethernet, CRT, DVI, COM1, 4x USB 2.0,PS/2, LEDs,Reset	COM1, CompactFlash access	COM 1/2, PS/2, Reset.	DVD/HDD-Carrier
Ethernet	1x 1000Base-Tx	1x 100Base-Tx	1x 10/100Base-Tx	2x 10/100/1000Base-Tx, Front or PICMG 2.16
Graphics	945GM internal	855GME internal	i82815 internal	855GME internal
PMC	none	none	none	1x 64 Bit/ 66 MHz
Power Consumption (typ.)	30 Watt / 1.86 GHz	20 Watt / 1.3 GHz	8 Watt / 400 MHz	12 Watt / 600 MHz

Cost sensitivity plays a major role in industrial applications. To meet this market demand additional to the customers technical requirements Kontron develops value line products like the CP-Pocket, CP30x-V and CP6xxx-V. Like the name implies, value line CompactPCI products are more economical, and deliver reduced performance. Nevertheless these products come with a high product availability, and competitive pricing for light industrial applications for many low cost operations in industrial, medical, and embedded control applications. The CP-POCKET line provides a very cost-effective solution for 3U CompactPCI. Specially designed for customers who do not need features like extended temperature range or shock & vibration issues, but still want to use the benefits of CompactPCI like hot swap, small 3U form factor, industrial computer standard.

PMC Modules
PMC Mezzanines

CP6500-V

LV Celeron® microBGA 400 MHz
133 MHz
256 kByte
Intel® 82815 GMCH and 82801 ICH4
up to 512 KByte SO-DIMM
133 MHz
Onboard
VGA (CRT), 2x Ethernet, 2x USB, LEDs, Reset, PMC, COM1
on request
2x 10/100 Base-Tx, PICMG 2.16
i82815 internal
1x 32 Bit/33 MHz
10 Watt / 400 MHz

PMC240

➤ 32/64-bit, 33/66 MHz PCI and/or 66/133 MHz PCI-X operation PMC Module
➤ 1 or 2 independent Gigabit Ethernet channels
➤ Copper and/or optical transmissions supported
➤ Auto detect of 10 Base-T,100 Base-TX or 1000 Base-T in copper network configurations
➤ 1000 Base-SX optical transmissions over SC-type connector technology

PMC253 - PROFIBUS

➤ Highly integrated EC-1 ASIC with ASPC-2 technology
➤ Up to 12 MBaud transfer rate
➤ Optoisolated RS485 PROFIBUS interface
➤ Easy to use software interface, OPC server and system configurator

PMC260 - SCSI

➤ Ultra2 SCSI I/O processor
➤ Up to 80 MByte/s transfer rate
➤ Wide LVD SCSI-bus
➤ Up to 15 SCSI peripherals, up to 12 m cable
➤ Supports SCSI-1, -2, -3, Ultra and Ultra2

PMC261 - SCSI

➤ 64-bit/133 MHz PCI-X (Ultra320) or 64-bit/66 MHz (Ultra160) PCI interface
➤ Dual channel Ultra320 / Ultra160 SCSI
➤ PMC I/O Module support (PIM) for rear I/O access
➤ Windows 2000, Windows XP and Linux support

CompactPCI Switch, I/O and Carrier Boards

3U Digital

Features	CP384	CP383	CP382	CP381
Digital In Channels	16 (24 V DC Nom.)	16 (24 V DC Nom.)	-	30 (24 V DC Nom.)
Input Voltage	Low Range: -3-5 V, High Range: 11-30 V	Low Range: -3-5 V, High Range: 11-30 V	-	Low Range: -3-5 V, High Range: 11-30 V
Input Current	5 mA	5 mA	-	5 mA
Digital Out Channels	8 Relay contacts	16 (24 V DC Nom.)	24 (24 V DC Nom.)	-
Output Current	max. 1 A per channel	max. 500 mA per channel	max. 500 mA per channel	-
Isolation	2 kV	2 kV	2 kV	2 kV

3U Analog
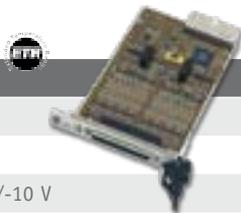
Features	CP371	CP372
Analog In Channels	16 (optionally 8)	-
Analog In Resolution	12 Bit	-
Input Voltage Range	0-5 V, 0-10 V, +/-5 V, +/-10 V	-
Input Current Range	0-20 mA, 4-20 mA	-
Analog In	Differential	-
Througput Rate	13 kHz	-
Analog Out Channels	-	8 (optionally 4)
Analog Out Resolution	-	12 Bit
Output Current	-	0-20 mA
Basic Accuracy	+/- 1 LSB	+/- 1 LSB
Isolation	2 kV	2 kV

3U / 6U PMC Carrier Boards
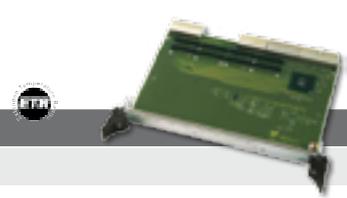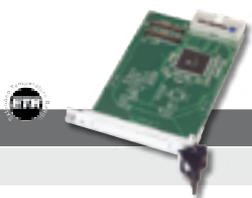
Features	CP390	CP690HS
Height	3U	6U
PCI Bus	32 Bit/33 MHz	64 Bit/66 MHz
PMC	1x 32 Bit	2x 64 Bit
Rear I/O	-	✓
Hot Swap	optional	✓

3U Controller Boards

Features	CP332	CP346	CP360
	Graphics Controller	**Serial Controller**	**SCSI Controller**
Interface	Dual DVI-i with DVI and CRT signals	RS232, RS422, RS485	Wide-Ultra2 (SCSI-3)
Form Factor	3U / 4HP	3U / 4HP	3U / 4HP
Channels	Dual head	4 independently controlled	one channel for 15 devices
Characteristics	Ultra High res. VGA	16550 UART compatible	Ultra SCSI-2 interface
Controller	ATI Radeon Mobility M9	Quad UART OX16PCI954	SCSI 53C895

3U Ethernet and Fieldbus Controller Boards

Features	CP342 *new*	CP353
Frontpanel	2x RJ45 or 2x SFP	9 pin D-sub for fieldbus connection, 9 pin D-sub fieldbus configuration
Function	two 10/100/1000Base-Tx or two 1000BaseFX	Profibus DP V1 Master/Slave
Data Rate	Up to Gigabit Ethernet	up to 12 MBit/sec.
Channels	2	1
Isolation	-	opto-isolated
Controller	Intel 82546GB	EC-1 System on Chip

3U / 6U Ethernet Switch Boards

available
Q2/2007

Features	CP6923 *new*	CP6925 *new*	CP932	CP930
Function	managed	unmanaged	unmanaged	unmanaged
Power Consumption (typ.)	35 Watt	5 Volt / 18 Watt	5 Volt / 8 Watt	5 V / 1.5 Watt
Dimensions H x W x D	6U / 4 HP	6U / 4 HP	3U / 4HP	3U / 4HP
Ports	24 Gigabit Ethernet	16 Gigabit Ethernet	five Gigabit Ethernet / one NIC	five Fast Ethernet
Connection	PICMG 2.16	PICMG 2.16	5x RJ45 / cPCI	RJ45/MTRJ1300 nm
Operating Temperature	0°C to 55°C	0°C to 55°C	-25°C to +75°C	-40°C to +85°C

Kontron's CompactPCI Services

Key Attributes

Software

Kontron has a broad and impressive knowledge base in different leading-edge hardware and platform technology areas. This, of course, includes the appropriate operating system support including Windows 2000/XP, XP Embedded, Linux and VxWorks.

Service

The changing world suggests that being responsive to customers' needs has grown in importance and it is no longer sufficient to merely supply innovative products. **You**, our customer, need timely and effective support to complete your design projects without delay.

Support

Kontron customers can rest assured that our technical support teams are there for you and able to answer even the most difficult questions for any of our vast number of products. Being one of the few board-level product vendors porting different real-time operating systems, we are able to provide complete hardware and software support for BSPs, drivers, networks, and fieldbuses, among others. Of course, you could also choose to have our support service available to you for on-site assistance.

Documentation

We at Kontron are very proud of our professional documentation available in electronic PDF format for all our CompactPCI products.

Environmental Awareness

Kontron recognizes that protection of the environment is a high corporate priority and a key determinant to sustainable development. Therefore, we are committed to conduct our business in an environmentally sound manner. Kontron has established an Environmental Management System (EMS) according to ISO 14001 and has been certified since 1999. Continuous improvement of our EMS and environmental activities are part of our ongoing goals.

Training

As part of our service package, we offer regularly scheduled seminars and training sessions on hardware, software and networking. Custom training is also available on request, and it is customary for us to provide onsite training to deliver the skills where they are needed most.

Longevity

Years of experience in the industrial application market have enabled us to appreciate the needs of our customers and, as a result, the maintenance and support of our products are geared to these requirements. We always plan far into the future which has a tremendous impact on the longevity of our products, as well as the choice of components, design reviews and alterations.

Custom Design and Engineering

Whether it be CompactPCI CPU boards, I/O boards, 19" chassis, complete systems or anything else from our broad product range, Kontron has at its disposal more than 25 years of accumulated experience in the industrial application market sector. Be sure to contact us to also talk about your custom solution needs.

Technology Outlook

System Management and Service Availability
The migration of proprietary hardware and software bundled applications to open architectures has many software implications. Many software building blocks are required to make a platform requiring only an application from the end customer. System management functions that used to be embedded in the applications and closely coupled with proprietary operating systems are a good example. The use of an open source operating system that can match the expected level of reliability, such as carrier grade Linux, brings new standardized ways of interfacing system management functions with hardware.

The **Intelligent Platform Management Interface (IPMI)** is the standard way (PICMG 2.9) of communicating management information among many system devices and a central system management controller. And of course IPMI is already supported through Kontron's high end 6U boards and systems. On the upper software layer, the controller must communicate to a management middleware that will handle the information and make decisions based on pre-established rules. The middleware must also be able to communicate in a standard way to the operating systems. A specification recently adopted by the SAF, the Hardware Platform Interface (HPI), has been implemented on Kontron's systems already.

Kontron platforms greatly reduce the customer effort needed to develop and deploy a highly reliable solution.

AdvancedTCA, AdvancedMC and MicroTCA
CompactPCI is now a widely adopted open standard for applications in many different markets with high packaging density and RAS features (reliability, availability, serviceability), including hot-swap capabilities. While several telecom applications have migrated to cPCI, a large share still remains on proprietary architectures. Targeting those demanding applications, a new open standard, **AdvancedTCA (Advanced Telecom Computing Architecture)**, was created by PICMG - bringing cPCI RAS features one step further and accepatble as a common hardware platform for a vast range of communications applications. AdvancedTCA, as a new carrier grade **blade and chassis** system standard, has proven to be an ideal and complementary solution to CompactPCI. While AdvancedTCA will allow telecom equipment manufacturers to speed up their time-to-market and reduce their development costs for anything in the wireless/wireline and IMS network applications, cPCI will continue exceptional growth as a more cost-effective solution for a spectrum of voice-oriented network elements.

(For more information about the AdvancedTCA specification, please see the PICMG website at www.picmg.org).

The proposed AdvancedMC (Advanced Mezzanine Card) specification (PICMG AMC.0 and PICMG AMC.1, AMC.2 and AMC.3 respectively) describes hotswappable and field-replaceable mezzanine cards that primarily target high-availability communications systems. AdvancedMC modules communicate with the ATCA carrier via high-speed serial interfaces with a variety of protocols, including Gigabit Ethernet and PCI Express. Where AMCs will even play a greater role will be with new and upcoming MicroTCA specification. MicroTCA uses AMC modules to implement small form factor backplane based system for computing and communications. The specification allows for a highly scalable range of systems from simplex, low cost systems to carrier grade, high availability systems, and is to be ideal for a full range of vertical market applications including DoD, medical, and enterprise segments.

Kontron, as a leading CompactPCI provider, plays a major role in the AdvancedTCA market and is working within the AMC and MicroTCA subcommitees, as well. For more information about Kontron Open Modular Solutions (OMS), please contact your Kontron sales or customer service representative.

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CompactPCI - Product Brochure - 20070207-WMH

CompactPCI - Product Brochure 2007

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