

Kontron unveils two new CompactPCI 6U Boards based on the Intel® Pentium® M Processor

Inside this issue:

- ADA in Embedded Applications 2
- Schroff subracks in Shanghai Transrapid 2
- Automated Code Inspection 3
- 90kg Telescopic Slides 3
- CP306; a low power 3U CPCI board with Pentium M 4
- 1U Monitor & Touchpad Chassis 4

For highest performance requirements Kontron offers two new cPCI 6U boards based on the Intel® Pentium® M processor – the **CP6000** and the **CP6011**. Both boards combine high performance with low power.

Both boards have identical cPCI rear I/O pinout as well as the Intelligent Platform Management Interface (IPMI) firmware that supports PICMG 2.9.

More About the CP6000

The CP6000 combines the low power/performance features of the Pentium M processor with the 855GME chipset. With up to 4 Gigabit Ethernet ports (2x at the front and 2x for full PICMG 2.16 support via J3 connector) the CP6000 is tailored to support cost-effective, performance-oriented applications.

The CP6000 features a single PCI-X PMC site, on board 2.5-inch hard disk (optional) and compact flash site, which can all be used simultaneously in a single

slot. This is made possible by the Intel 6300ESB I/O controller hub which includes USB 2.0, Serial ATA150 and onboard 64/66 PCI-X bus. Two 200-pin SODIMM sockets support up to 2GByte of PC333 DDR SDRAM. As an option, the 1.1GHz version of the CP6000 is available in extended temperature range (-40°C to +85°C).

With the 855GME chipset, the CP6000 provides high-resolution graphics and multimedia-quality video via the integrated graphic controller. The controller uses Intel's Extreme Graphics 2 Technology (2D/3D graphics accelerator) to provide a 2048 x 1536 x 8 Bit/60Hz pixel resolution. In addition to VGA, USB and COM interfaces, the front panel of the CP9000 hosts various user programmable LEDs.

The CP6011 in Detail

The CP6011 combines the low power/performance features of the Pentium M processor with

the high I/O bandwidth of the Intel E7501 chipset. The board is

The Pentium M processor on both boards is passively cooled and is available in the 1.1 GHz, 1.6 GHz and also in the 1.8 GHz version (Intel Pentium M Processor 745). Performance of a 1.6 GHz Pentium M processor matches that of a conventional Intel Pentium 4 processor clocked at 2.4 to 2.7 GHz. A Pentium M processor generates only half the heat of a Mobile Pentium 4 Processor while providing the same level of performance.

tailored for applications requiring high performance, flexibility and density. Two SODIMM sockets accommodate up to 2 GByte of memory with ECC support. The first PMC slot has a PIM interface and a PCI-X interface with speeds of up to 64 Bit/133 MHz. The second PMC slot has a speed of 64 Bit / 66 MHz. The CP6011 also features dual Gigabit Ethernet with PICMG 2.16 support and one Fast Ethernet interface on the front panel for management purposes or others.

The cPCI bus offers high bandwidth with a PCI-X interface to provide a data flow rate of 64 Bits / 133 MHz. An ATI Mobility-M graphics chip with 4MB of memory provides a video resolution of up to 1900x1200 pixels. The CP6011 features programmable user LEDs on the front panel as well as two PMC, Ethernet and COM connectors.

CP6000 and CP6011 with Pentium M 1.8 GHz are available now.



ADA in Embedded Applications

With embedded systems residing in a variety of applications ranging from satellite and telecommunication systems to networking routers and passenger aircraft, an increasing number of lives and dollars now depend on the reliability of embedded systems software. Joint Strike Fighter, various armored vehicle programs, the Apache helicopter—dozens of programs, maybe more—are still actively developing in Ada and spending millions of dollars. Boeing's choice of Ada for high-profile commercial projects like the Boeing 7e7 is a good example. Ada is surfacing outside the traditional realm of aviation and aerospace, in applications as diverse as meteorological imaging and yachting security. Compaq, for example, used Ada to implement its IN7 project, first on SCO Unix, then on Tru64 Unix v5.1, replacing DECada. IN7 is a relatively complex code mixing several languages and compilation tools, and one of the major difficulties was to get the generated code to run correctly.

- Ada is highly reliable because its compilers rigorously check the code at compile-time, enabling the programmer to locate and remove defects early in the programming process.
- First generation Ada compilers produced large executables, and the stigma of large executables stuck with the language.

Today's optimizing Ada compilers produce the tightest embedded system code available.

- Ada effectively compartmentalizes code at run-time, eliminating unpredictable interactions between code modules.
- Ada code is easily portable across microprocessor architectures, making hardware migration and upgrades cheaper and faster.
- Ada code is inherently very readable; errors are easy to locate and correct before compile-time.
- Ada uses a modularized structure with generic procedures and data abstractions. The result is exceedingly reusable software components, reducing costs for each new project. NASA did a systematic assessment that measured between 60 percent and 80 percent Ada code reuse from one satellite system to the next. This was comparing reuse against past use of Fortran, which was NASA's primary language for satellite systems. With Fortran, code reuse was about 25 percent to 30 percent.
- All Ada compilers verify code against the Ada standard using the Ada Conformance Assessment Test Suite (ACATS formerly known as the ACVC tests).

Story ID 2

Suspension Railway in Shanghai: 30km in 8 minutes Schroff subracks in Transrapid

The first commercial Transrapid route in Shanghai connects the Long Yang Road underground station with the new Pudong International Airport. Along the 30 km route three Transrapid trains with five sections each and a maximum



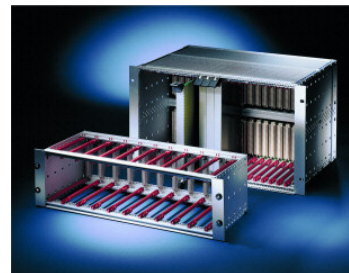
speed of up to 430 km/h are deployed. For this demonstration project of new transport technologies for the 21st century conventional and proven mechanical components such as a large number of **SCHROFF europacPRO subracks** are being used, without which the operation of the Transrapid would be hard to realise.

In each section of the Transrapid a multitude of electronic components and systems are housed, which make possible and guarantee the trouble free operation. Following a stringent selection process, Schroff's highly flexible 19" subracks were chosen.

With these modular subrack the user can realise different heights, widths and depths with the flexibly combined stan-

dard parts, competitively and without great assembly effort. Expensively customised units as generally not needed.

The basic model consists of two side panels and four horizontal rails. With the extensive range of accessories the user has the possibility to retrofit subracks depending on demand and step by step. Especially with respect to EMC, this is a great advantage, as it is often unclear at the beginning of the development, which level of EMC shielding will be required for the application. For instance contact springs, which can be inserted between the assembly parts



such as cover plates and side panels, or conductive textile shielding in the front panels of plug-in units, guarantee safe HF shielding.

Furthermore guide rails are part of the standard range, which allow flexible arrangement of all board positions and also have some advantageous features such as the insulated board guidance, coding facility of 19" plug-in units, ESD clip for board guidance and board protection. Guide rails can also be screwed onto the horizontal rails for extreme protection against shock and vibration. The europacPRO is based on Al sheets and Al extrusions. As Schroff anodises all front facing surfaces and chromates all rear surfaces, the user obtains not only scratch proof but also optically appealing designs.

Story ID 3

Automated Code Inspection cuts development cost and produces quality code.

Software quality and the software design process determine the success of any software engineering project, future code portability, maintainability and of course customer satisfaction.

Engineering teams around the world are being pushed to meet unrealistic deadlines brought on by ever growing time-to-market demands and customer expectations. It comes as no surprise that time pressures and dead lines often result in neglecting software coding standards.

How does one estimate the time required to complete an individual module or project? An experienced engineer determines the maximum time required to implement every aspect of the code development and then multiplies that number by a safety factor. Such "educated guess work" however rarely takes into account the quality of legacy code to be re-used in the project and the quality of the code delivered at the end of the project. Neither does it consider the larger team and inefficiencies brought on by disparate coding styles within it. Engineering teams are rarely static and with new members cycling on and off, project teams require some mechanism to ensure that the integrity of the software coding standard is maintained -better enforced.

In the rush to market the tasks most frequently omitted are manual code inspections and peer reviews. Evidence however shows that this is exactly the wrong thing to do. Look at this study by Alcatel: Two separate groups were set the task of developing a particular application. Code inspections were

mandated in one group while in the other one only limited inspections were performed.

The result was that the initial time invested in the inspections was well recovered during both integration and system testing. The study did not take into account future additional savings by means of better code maintainability and portability.

Even where software teams are aware of this, the initial time investment in manual code reviews and audits may not be achievable. Peer reviews can be slow, laborious and confrontational and it is

quite often crucial to be on time at an early stage in the project where the customer may only be partially committed.

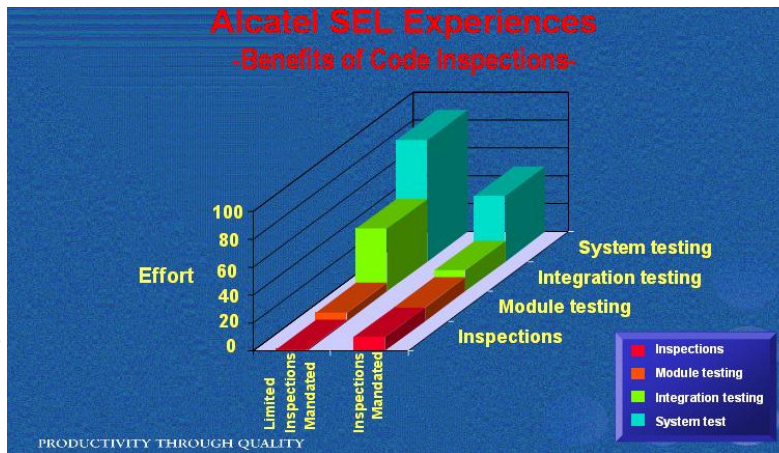
One solution to the above problem is to automate the code inspection process. You receive all of the benefits of the process but in a fraction of the time.

Programming Research (PRL) produces best of breed static analysis tools for both C and C++. The focus on these languages comes as no surprise as their appealing flexibility

quite often translates into side effects, readability issues and custom language implementations used by an ever growing array of compilers (why else would there be so many tools for testing dynamic behaviour like memory leaks, coverage, profiling and trace?)

PRL's static analysis tools not only make allowances for compiler specific language implementation but additionally make use of supplied coding standards or even implemented in-house standards. As these standards enforce automatically during development there is an additional benefit to the new team member who tries to fit into the process. The Metrics Suit supplied can point to a function, file or class level latent problem either in coding behaviour, testing or maintainability.

Story ID 4



Rugged telescopic rails with up to 90 kg load capacity.

Elma Electronic AG has introduced a new range of rugged telescopic slides for demanding applications. Features include:

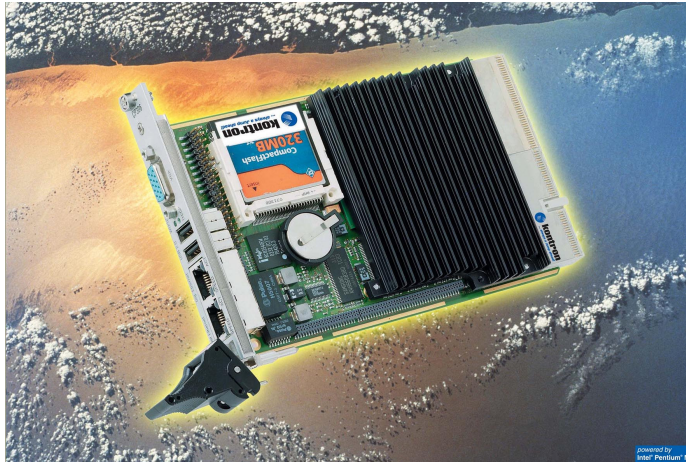
- 90 kg load capacity per pair
- Extension up to 566 mm
- Made from sheet steel, zinc plated
- 19" flanges with closed mounting holes (improved stability)
- Adjustable brackets for cabinet depth from 582 mm to 1001 mm
- Specifications according MIL-standard (Tests in process)
- ball bearing assisted movement
- Securely locked in extended position
- Ultra thin for mounting of 84HP subrack into 19" cabinet.



Story ID 5

CP306: A Low Power 3U CompactPCI CPU Board with Intel® Pentium® M Processor 745

The Kontron CompactPCI 3HE CPU CP306 with 1.8 GHz Intel Pentium M Processor is as high-power as the 2.8 GHz Intel Pentium 4 Processor. Nevertheless, the board needs only passive cooling methods as the power dissipation has been reduced by approximately 50 percent. As processor and memory are both soldered directly to the board, the CP306 is suit-



able for use in harsh environments. Typical applications include robots, mobile data acquisition systems, aircraft cock-

pits, train driver cabins and military deployed systems.

In addition to the existing 1.1 and 1.6 GHz Pentium M with passive cooling methods Kontron now also offers the 1.8 GHz version (Intel Pentium M Processor 745).

The CP306 CPU board includes extensive communication interfaces as well as a high performance processor with up to 1.8 GHz clock rate, 1MB L2 on the cache, 333 MHz memory clock rate and 400 MHz processor side bus. The on-board communications interfaces include 1 x Gigabit Ethernet, 1 x Fast Ethernet, 4 x USB 2.0 and up to 4 COM channels. Kontron also can enhance the peripheral interface upon request using rear I/O modules. A dual ATA100 interface is provided as well as a CompactFlash socket. Memory options include a maximum of 1 GByte DDR-SDRAM/PC333 (with ECC). The board is available in single slot (4HP) or a dual slot (8HP width). The 8HP CP306 variant provides legacy support and a 2.5" HDD carrier. If less performance is needed, systems can be scaled with the 1.1 GHz version according to application requirements. The CP306 is also designed for the extended temperature range (-40°C to +85°C).

The operating systems supported include Windows XP, XP Embedded and 2000, Linux and VxWorks.

Story ID 6

1 U Monitor-Touchpad-Keybaord chassis from Schroff

Schroff has introduced a new 1 U monitor with keyboard and touchpad, RAL 9005, with telescopic rails, monitor connection with VGA, keyboard and touchpad connection with PS/2 connectors.

- LCD Monitor 15.1" TFT; max. 1024 x 786 pixel
- Colours: 16.7 million
- Contrast 400:1
- Brightness: 230cd/m²
- Keyboard: PS/2; 105 keys; 10 million strokes
- Keyboard with US or German layout
- Touchpad with 2 mouse keys
- Win.; Unix ; Linux compatible
- Depth adjustable
- MTBF 30,000h
- Power Consumption 35W
- Approvals: UL, CE, FCC-A
- Weight: 18kg



Story ID 7

Please email us the Story ID for more information.