Intel® 4th Generation Core™ i5/i7 CompactPCI® Processor Board

» High Performance Processor and Graphics
   4th Generation Intel® Core™ i5/i7 processors with up to 16 GByte ECC memory

» High Speed Interconnections
   Optionally dual 10 Gigabit/s Ethernet and PCIe Gen 3 on backplane

» Highest Versatility and Excellent Power Management
   Comprehensive I/O capabilities: 1/10 GigEthernet, PCIe Gen.3, PMC/XMC, USB, VGA, DVI, RAID, SSD ...

» Broad Software Support
   Complete Board Support Packages for On Board Hardware and Toolchain
CP6005(X)-SA
6U CompactPCI® processor board based on Intel® 4th generation Core™ i7/i5 processors - option for 10 Gigabit Ethernet & PCIe on the backplane

Beyond Existing Limits
With the powerful quad core Intel® Core™ i7/i5 4th generation processors, the Kontron CP6005(X)-SA processor family offers extraordinary performance per watt values and is an ideal backbone for powerful network intensive applications, providing virtualization (VT-X, VT-D) and highest graphics performance by up to 20 graphics cores supporting OpenCL 1.2 and OpenGL3.2 and 3 independent interfaces. 5 Gigabit Ethernet channels on the CP6005-SA provide well weighted data throughput for external and internal PICMG® 2.16 compliant Ethernet traffic. The Kontron processor board CP6005X-SA supports two additional 10 Gigabit Ethernet ports combined with PCI Express® 3.0 x4 on the backplane, all based on PICMG® 2.20 for high bandwidth requirements.

The Intel® Advanced Vector Extensions AVX 2.0 enhancements provide a huge performance improvement in floating-point-intensive computations which are a key part of digital signal and image processing applications such as medical imaging and radar or sonar.

Both PICMG 2.16-compliant Kontron CP6005-SA and CP6005X-SA processor boards offer up to 16GB dual channel 1600 MHz DDR3L ECC memory via two SODIMM sockets, providing up to 25 GB/sec data throughput. Thanks to hotswap support and IPMI (PICMG 2.9-compliant Intelligent Platform Management Interface) the CPU board meets the highest demands for the management of high availability applications. Many of these are data and tele-communications applications, but also include highly sensitive, security related solutions as well as image processing systems.

Unique Versatility
The Intel® Platform Controller Hub QM87 provides advanced I/O technology including USB and Serial ATA channels for an onboard 2.5-inch SATA hard disk or SSD and an industrial grade NAND Flash SSD device - all usable in a 4HP single slot.

The highly integrated CP6005(X)-SA features also an XMC site according to XMC.3 supporting x8 PCI Express® (alternatively a 64-bit/133MHz PCI PMC site) for various market available extensions. Based on the Kontron rear I/O concept, existing rear I/O transition modules are fully functional on the CP6005-SA, where the CP6005X-SA provides additional 10GbE and PCIe on the backplane for communication between CompactPCI® slots. Appropriate backplanes and systems are available.

Longterm Availability
Delivering a stable product based on Intel®’s embedded product line, the CP6005(X)-SA ensures long term availability. This eliminates the risk of unplanned design changes and unexpected expensive application modification. While minimizing deployment risks, the CP6005(X)-SA provides a broad range of software support to ease the process of product integration and maximize the competitive advantage of meeting the time-to-market window.
### Technical Information

#### Processor
Intel® Core™ i7/i5 Processor 4th Generation, code name ‘Haswell’

#### Platform Controller Hub
- **System Memory**: Intel® QM87
- **Flash BIOS**: Two redundant 8 MByte SPI flashes

#### Memory
- **System Memory**: Up to 16GB soldered dual channel DDR3L memory with ECC and data speed of up to 1600 MHz per channel
- **NAND Flash**: Socket for optional Kontron Solid State Drive up to 64GB SLC flash technology

#### Front Panel Functions
- **Gigabit Ethernet**: 3x 1000BASE-T Ethernet channels
- **USB Interface**: 2x USB2.0 interface on USB-A host connector
- **Serial**: 1x RS232 serial interface on RJ45 connector
- **Analog Monitor**: DSUB connector for analog monitors
- **Micro Switch**: For Hot Swap and reset
- **Status LED**: Eight bicolor (red and green) control and status LEDs, Two IPMI LEDs, One Watchdog and one thermal LED, Four GP LEDs, One blue hot swap LED

#### Onboard Interfaces
- **Gigabit Ethernet**: Two PICMG 2.16 rear I/O 1000BASE-T ports
- **SATA / NAND Flash**: Four ports fixed to rear I/O, One port available for mounting an optional 2.5” HDD or SSD NAND Flash One port available for mounting an optional NAND Flash module
- **Serial Port**: COM1 (RS232) routed to front panel and rear I/O
- **CompactPCI® Bus**: PICMG 2.0 Rev. 3.0 compatible, 64-bit / 66 MHz, Universal V(I/O) 5V or 3.3V signalling, in operation in system slot as system master and in peripheral slot in PCI passive mode (no communication to CompactPCI® bus)
- **PMc/XMC**: One 64-bit / 133 MHz PMC slot, Pn1-Pn4, rear 1/0 Pn3 to J4, 3.3 volt V(I/O), Alternatively one XMC slot via P15, supporting XMC.3 x8 PCIe Express®

#### Rear IO
- **J3**: 2x ETH acc. PICMG 2.16, 2x ETH, VGA, COM 1/2, 4x USB, GPIO, Speaker, fan sense
- **J4**: CP6005-SA: not assembled; CP6005X-SA 2x 10GBASE-KR, PCIe Gen3 x4
- **J5**: 4x SATA, 2xHDMI, HDA, battery, fan control, additional GPIO

#### Supervisory Functions
- **Clock/Calendar**: Watchdog, software configurable, 125 m sec to 256 sec, generates IRQ or hardware reset.
- **Hardware monitor for thermal control, fan speed, and all onboard voltages**
- **RTC battery backup**

#### IPMI
IPMI 1.5-compliant for IPMI based management and CompactPCI® System Management PICMG 2.9 R1.0

#### TPM
Trusted Platform Module (TPM) 1.2 for enhanced hardware and software based data and system security

#### I/O Table Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Front IO</th>
<th>Rear IO</th>
<th>Onboard Connector</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRT</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DVI/HDMI</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>6</td>
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<tr>
<td>USB2.0</td>
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<td>2</td>
<td></td>
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<tr>
<td>HD Audio</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Serial</td>
<td></td>
<td>2 (RS232, RS422)</td>
<td></td>
<td>2 (*)</td>
</tr>
<tr>
<td>Ethernet</td>
<td></td>
<td>2 (**)</td>
<td></td>
<td>5 (*)</td>
</tr>
<tr>
<td>SATA</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>SATA NAND Flash</td>
<td></td>
<td>1</td>
<td></td>
<td>1 (in 6 SATA incl)</td>
</tr>
<tr>
<td>PMC/XMC</td>
<td></td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Fan Control</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Battery Input</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SMB</td>
<td></td>
<td>1 optional</td>
<td></td>
<td>1 optional</td>
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</table>

#### Compliancy
- CompactPCI® Core Specification PICMG 2.0 Rev. 3.0
- CompactPCI® Hot Swap Specification PICMG 2.1 R2.0
- CompactPCI® System Management PICMG 2.9 R1.0
- CompactPCI® Packet Switching Backplane PICMG 2.16 R1.0

#### MTBF
- 185968 h MIL-HDBK-217 FN2 Ground Benign 30°
- 230420 h Bellcore Issue 6 Ground Benign 40°

#### Dimensions
- 233 x 160 x 20.5 mm, 6U, 4HP

#### Weight
- Approx. 800gr

#### Software Support
- Phoenix EFI (BIOS) with POST codes, BIOS parameters saved in EEPROM, diskless, keyboardless, videoless operation, LAN boot support
- Board identification number accessible via EEPROM, Support for Windows® 7, Windows® Server 2008R2, Linux®, VxWorks (other O/S may be possible, please contact us for information)

#### Power Consumption
- Up to 60 watts (quad core), up to 50 watts (dual core) or less, depending on CPU type

#### Operating temp.
- 0°C to +60°C, passive module heat sink, requires forced airflow cooling, Extended temperature on request
- -55°C to + 85°C (without battery or HDD)

#### Storage temp.
- 93% RH at 40°C, non condensing (acc. to IEC 60068-2-78)

#### Altitude
- 50,000 ft (15,240 m)
CPU Boards

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
</table>
| CP6005-SA-2.4Q-8 | Quad Core 2.4 GHz, Intel® Core™ i7-4700EQ  
» 8GB SODIMM dual channel DDR3L memory 1600 MHz with ECC  
» Backplane connector J4 not assembled  
» Temperature range 0°C to +60°C  
» Standard air cooled |
| CP6005X-SA-2.4Q-8 | Quad Core 2.4 GHz, Intel® Core™ i7-4700EQ  
» 8GB SODIMM dual channel DDR3L memory 1600 MHz with ECC  
» Dual 10Gigabit/s and PCIe Gen3 x4 on backplane connector J4 (ZDPlus)  
» Temperature range 0°C to +60°C  
» Standard air cooled |
| CP6005-SA-1.8Q-GT3-8 | Quad Core 1.8 GHz, Intel® Core™ i7-4860EQ, GT3 graphics  
» 8GB SODIMM dual channel DDR3L memory 1600 MHz with ECC  
» Backplane connector J4 not assembled  
» Temperature range 0°C to +60°C  
» Standard air cooled |
| CP6005-SA-2.7D-8 | Dual Core 2.7 GHz, Intel® Core™ i5-4400E  
» 8GB SODIMM dual channel DDR3L memory 1600 MHz with ECC  
» Backplane connector J4 not assembled  
» Temperature range 0°C to +60°C  
» Standard air cooled |
| CP6005-SA-2.7D-8-E1X | Dual Core 2.7 GHz, Intel® Core™ i5-4400E  
» 8GB SODIMM dual channel DDR3L memory 1600 MHz with ECC  
» Backplane connector J4 not assembled  
» Temperature range -40°C to +70°C  
» Standard air cooled |

Accessories

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash-SATA</td>
<td>Various Kontron SSD products / sizes available</td>
</tr>
<tr>
<td>CP-RAPID3</td>
<td>PICMG 2.20 based system for 6U CompactPCI high speed interconnects</td>
</tr>
</tbody>
</table>

Rear Transition Modules

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-RIO6-001</td>
<td>4HP Rear I/O Module for CP6005(X)-SA with 2x DVI-D; 2xUSB2.0; 2xGbE; headers for 2xCOM, Flash, SATA, Fan</td>
</tr>
<tr>
<td>CP-RIO6-001-HD</td>
<td>4HP Rear I/O Module for CP6005(X)-SA with 1x DVI-D; 2xUSB2.0; 2xGbE; socket for SATA 2.5” disk; headers for 2xCOM, Flash, SATA, Fan</td>
</tr>
<tr>
<td>CP-RIO6-001-HD-216</td>
<td>Similar to CP-RIO6-001-HD, but P16M compatible; without external Ethernet</td>
</tr>
<tr>
<td>CP-RIO6-001-HD-VGA</td>
<td>Similar to CP-RIO6-001-HD, but with VGA interface instead of DVI-D</td>
</tr>
<tr>
<td>CP-RIO6-B</td>
<td>4HP Rear I/O Module for CP6005(X)-SA with 2xUSB, 2xGbE; Audio, 2xCOM, HDMI, Connectors for USB Flash, 4x SATA, Fan</td>
</tr>
<tr>
<td>CP-RIO6-B-216</td>
<td>Similar to CP-RIO6-B, but P16M compatible; without external Ethernet ports</td>
</tr>
<tr>
<td>CP-RIO6-A</td>
<td>4HP Rear I/O Module for CP6005(X)-SA with 2xUSB, 2xGbE; Audio, 2xCOM, VGA, Connectors for USB Flash, 4x SATA, Fan</td>
</tr>
<tr>
<td>CP-RIO6-A-216</td>
<td>Similar to CP-RIO6-A, but P16M compatible; without external Ethernet ports</td>
</tr>
</tbody>
</table>

Software Support

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>Documentation and Windows driver kit (Windows 7 / 2008R2)</td>
</tr>
<tr>
<td>Linux</td>
<td>Linux Fedora and RedHat Board Support Package and documentation</td>
</tr>
<tr>
<td>Windriver Linux</td>
<td>Windriver Linux Board Support Package and documentation</td>
</tr>
<tr>
<td>VxWorks</td>
<td>VxWorks 6.9.x Board Support Package and documentation</td>
</tr>
<tr>
<td>QNX</td>
<td>QNX Board Support Package and documentation</td>
</tr>
</tbody>
</table>

Ordering Information