Rugged Intel® Third Generation Core™ i7 CompactPCI® Processor Board

» Dual- or Quad-Core Performance
  Third Generation Intel® Core™ i7 processor with up to 16 GByte Soldered Memory

» Ruggedized
  Rugged Air and Conduction Cooled Low Power Processor Board

» Highest Versatility and Excellent Power Management
  Comprehensive I/O capabilities: GigEthernet, PMC/XMC, USB, VGA, DVI, RAID, NAND Flash …

» Broad Software Support
  Complete Board Support Packages for On Board Hardware and Toolchain
CP6004-RA/RC
Rugged Intel® Third Generation Core™ i7 Processor Board

Rugged applications are mainly determined by high shock, vibration, and temperature levels. The Kontron 6U CompactPCI® processor boards CP6004-RA and CP6004-RC are the first choice, when computing performance is required in rugged air or conduction cooled 6U CompactPCI® systems.

The CP6004-RA/RC, a CompactPCI® PICMG 2.16 compliant 6U CPU board, comes with various rugged levels, making it yet another addition to Kontron’s rugged PICMG 2.16 portfolio. Based on the Intel® Core™ i7 third generation processor and the QM77 platform controller hub, the CP6004-RA/RC is featured by dual or quad core computing performance at a reasonable thermal design power, including a complete set of data, communication and multimedia interfaces.

Maximum Ruggedization
Designed to withstand even the toughest environmental conditions, the passively cooled CP6004-RA/RC featured by soldered memory including ECC and industrial grade flash modules comes in two rugged levels – defined as RA and RC.

The CP6004-RA version is designed for harsh application requirements in air-cooled environments, where the CP6004-RC is made for conduction cooled environments. Depending on the processor type, both versions are available in extended temperature ranges from -40°C to +70°C.

With the 2.1 GHz Intel® Core™ i7-3612QE and the LV 2.5 GHz Intel® Core™i7-3555LE, the CP6004-RA/RC has extraordinary performance per watt values. Up to 16 GByte of soldered DDR3 1600 MHz memory with ECC provide the foundation of demanding software applications. Based on the Intel® Mobile QM77 I/O controller hub the CP6004-RA/RC provides high graphics performance for VGA and up to three independent digital video outputs to the rear I/O as well as HDA audio capabilities.

Comprehensive Versatility
Besides the outstanding graphics performance, the CP6004-RA/RC offers comprehensive I/O capability with up to 5 × 1Gb Ethernet, 4 × rear I/O SATA with RAID 0/1/5/10 functionality, a local SATA Flash disk connector, as well as 6 × USB 2.0, 2 × COM. It can also accommodate a conduction cooled PMC/XMC slot for I/O intensive applications.

Unique Security
The board provides safety and security via an optional trusted platform module, (TPM 1.2), two redundant firmware hubs (failover) and IPMI support according PICMG 2.9 R1.0.

Long-term Availability
Delivering a stable product based on Intel®’s embedded product line the CP6004-RA/RC ensures long-term availability.
Processor

Intel® Core™ i7 Processor Third Generation (22 nm manufacturing process)
Intel® Core™ i7-3612QE (quad core) or Intel® Core™ i7-3555LE (dual core) low voltage processor

Platform Controller Hub

Intel® QM77

Memory

System Memory
Up to 16GB soldered dual channel DDR3 memory with ECC and data speed of up to 1600 MHz per channel

NAND Flash
Socket for optional Kontron Solid State Drive

Flash BIOS
Two redundant 8 MByte SPI Flashes

Front Panel Functions

3x Gigabit Ethernet channel, 2 switchable to rear I/O*
2x USB2.0 interface*
1x RS232 serial interface*
Displayport connector (adapters for VGA available)*
For Hot Swap and reset
For Hot Swap and Ethernet status information

Onboard Interfaces

CP6004-RC: 4 ports 10/100/1000BASE-T to rear I/O
CP6004-RA: 2 ports according PICMG2.16, 3 ports front I/O; 2 of them switchable to rear I/O
Four SATA ports fixed to rear I/O (SATA 3Gb/s)
One onboard SATA channel available for mounting an optional Kontron SSD (SATA 6Gb/s)
CP6004-RA: 1x RS232 (routed to front and rear I/O) and 1x RS232/RS422 fixed to rear I/O
CP6004-RC: 1x RS232 and 1x RS232/422 fixed to rear I/O

CPCI Bus

PICI 2.0 Rev. 3.0 compatible, 64-bit / 66 MHz
Universal V(I/O) 5V or 3.3V signaling
Operating in system slot as system master and in peripheral slot in PCI passive mode (no communication to CompactPCI® bus)
One 64-bit / 133 MHz conduction cooled PCI slot, Pn1-Pn4, rear I/O Pn3 to J4, 3.3 volt V(I/O)
Alternatively one conduction cooled XMC slot via P15, supporting XMC 3.8 PCI Express

Supervisory Functions,
Clock/Calendar

Watchdog, software configurable, 125 msec 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

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

I/O Table Summary

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<thead>
<tr>
<th>Description</th>
<th>Front I/O</th>
<th>Rear I/O</th>
<th>Onboard Connector</th>
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<td>4</td>
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<td>Ethernet</td>
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<td>4 (4**)</td>
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<td>(*) On CP6004-RA only</td>
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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

Designed to meet or exceed:

» Safety: UL 1950, UL 94, CSA 22.2 No 950, EN 60950, IEC 950
» EMI/EMC: EN 55022 / EN 55024, EN 50081-1 / EN 61000-6-2
Technical Information (continued)

MTBF

- CP6004R 156125 h MIL-HDBK-217 FN2 Ground Benign 30°
- CP6004R 82762 h Bellcore Issue 6 Ground Benign 30°

Dimensions

233 x 160 x 20.5 mm, 6U, 4HP

Weight

Approx. 800gr

Software Support

AMI EFI (BIOS) with POST codes, setup console redirection to serial port (VT100 mode) with CMOS setup access. BIOS parameters saved in EEPROM, diskless, keyboardless, videoclipless operation.

LAN boot support

Board identification number accessible via EEPROM

Support for Windows® 7, XP, XP Embedded, Windows® Server 2008R2, Linux®, VxWorks® (other Oss may be possible, please contact us for information)

Power Consumption

Maximum: up to 60 watts (quad-core), 40 watts (dual-core)

Environmental

- **CP6004-RA**
  - Quad-Core: VITA 47 V2/OS1, -40° to +70°C, forced air cooling required
  - Dual-Core LV: VITA 47 V2/OS1 -40° to +70°C, forced air cooling required

- **CP6004-RC**
  - Quad-Core: VITA 47 V3/OS2 -40° to +70°C
  - Dual-Core LV: VITA 47 V3/OS2 -40° to +70°C

EN50022 class B
EN55024
EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11

All: Extended temperature versions on request.

Ordering Information

**Article**

**Description**

**CPU Boards**

**CP6004-RA-2.1Q-8G-E1X**
- Quad-Core 2.1 GHz, Core i7-3612QE
- 8GB soldered dual channel DDR3 memory 1600 MHz with ECC
- Temperature range -40°C to +70°C
- Rugged air cooled

**CP6004-RA-2.5D-8G-E1X**
- Dual-Core 2.5 GHz, Core i7-3555LE
- 8GB soldered dual channel DDR3 memory 1600 MHz with ECC
- Temperature range -40°C to +70°C
- Rugged air cooled

**CP6004-RC-2.1Q-16G-E1X-C**
- Quad-Core 2.1 GHz, Core i7-3612QE
- 16GB soldered dual channel DDR3 memory 1600 MHz with ECC
- Temperature range -40°C to +70°C
- Rugged conduction cooled, conformal coating

**CP6004-RC-2.5D-8G-E1X-C**
- Dual-Core 2.5 GHz, Core i7-3555LE
- 8GB soldered dual channel DDR3 memory 1600 MHz with ECC
- Temperature range -40°C to +70°C
- Rugged conduction cooled, conformal coating

**Accessories**

**Flash-SATA**
Various Kontron SSD products / sizes available

**CABLE-GRAPHIC-DP-TO-DVI**
Adapter cable DisplayPort to DVI, 19 cm

**Rear Transition Modules**
Several versions on request

**Software Support (All packages downloadable from Web)**

**Windows**
Documentation and Windows XP, 7, WES, Server 2003/2008-R2 driver kit

**Linux**
Linux (Redhat, Fedora, Windriver) Board Support Package

**VxWorks**
VxWorks 6.x Board Support Package

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