Rugged Intel® Second Generation Core™ i7 CompactPCI Processor Board

» Dual- or Quad-Core Performance
  Second 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
CP6003-RA/RC
Rugged Intel® Second Generation Core™ i7 Processor Board

Rugged applications are mainly determined by high shock, vibration, and temperature levels. The Kontron 6U CompactPCI processor boards CP6003-RA and CP6003-RC are the first choice, when computing performance is required in rugged air or conduction cooled 6U CompactPCI systems.

The CP6003-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 second generation processor and the QM67 platform controller hub, the CP6003-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 CP6003-RA/RC featured by soldered memory including ECC and industrial grade flash modules comes in two rugged levels – defined as RA and RC.

The CP6003-RA version is designed for harsh application requirements in air-cooled environments, where the CP6003-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™ i7-2715QE and the LV 2.2 GHz Intel® Core™i7-2655LE, the CP6003-RA/RC has extraordinary performance per watt values. Up to 16 GByte of soldered DDR3 1333 MHz memory with ECC provide the foundation of demanding software applications. Based on the Intel® Mobile QM67 I/O controller hub the CP6003-RA/RC provides high graphics performance for VGA and two independent digital video outputs to the rear I/O as well as HDA audio capabilities.

Comprehensive Versatility
Besides the outstanding graphics performance, the CP6003-RA/RC offers comprehensive I/O capability with up to 5 x 1Gb Ethernet, 4 x rear I/O SATA with RAID 0/1/5/10 functionality, a local SATA flash disk connector, as well as 6 x USB 2.0, 2 x 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 CP6003-RA/RC ensures long-term availability.
### Technical Information

#### Processor
Intel® Core™ i7 Processor Second Generation (32 nm manufacturing process)
Intel® Core™ i7-2715QE (quad core) or Intel® Core™ i7-2655LE (dual core) low voltage processor

#### Platform Controller Hub
Intel® QM67

#### Memory
System Memory
Up to 16GB soldered dual channel DDR3 memory with ECC and data speed of up to 1333 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

*on CP6003-RA version only

#### Onboard Interfaces

<table>
<thead>
<tr>
<th>Description</th>
<th>Front I/O</th>
<th>Rear I/O</th>
<th>Onboard Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video CRT</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>DVI/HDMI</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>USB 2.0</td>
<td>2*</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>HD Audio</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Serial</td>
<td>1*</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Ethernet</td>
<td>3*</td>
<td>4 (4**)</td>
<td>-</td>
</tr>
<tr>
<td>SATA</td>
<td>-</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>SATA NAND Flash</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PMC / XMC</td>
<td>-</td>
<td>-</td>
<td>1/1</td>
</tr>
<tr>
<td>FAN control</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Battery Input</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>SMB</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

*) On CP6003-RA only  ***) CP6003-RA 2 rear I/O + 3 front I/O, 2 of them switchable to rear I/O

#### Rear I/O
J3: 2x ETH acc. PICMG 2.16, 2x ETH, VGA, COM 1/2, 4x USB, GPIO, Speaker, fan sense
J4: PMC rear I/O
J5: 4x SATA, 2xHDMI, HDA, battery, fan control, additional GPIO

#### 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

#### 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

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## Technical Information (continued)

<table>
<thead>
<tr>
<th>MTBF</th>
<th>153663h</th>
<th>MIL-HDBK-217 FN2</th>
<th>Ground Benign 30°</th>
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<tr>
<td></td>
<td>103883h</td>
<td>Bellcore Issue 6</td>
<td>Ground Benign 30°</td>
</tr>
</tbody>
</table>

### 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, videocell operation.

LAN boot support

Board identification number accessible via EEPROM

Support for Windows® 7, XP, XP Embedded, Windows® Server 2008R2, Linux®, VxWorks®

(other O/Ss may be possible, please contact us for information)

### Power Consumption

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

### Environmental

- **CP6003-RA**
  - Quad-Core:  VITA 47 V2/OS1, -40° to +55°C, forced air cooling required
  - Dual-Core LV:  VITA 47 V2/OS1 -40° to +70°C, forced air cooling required

- **CP6003-RC**
  - Quad-Core:  VITA 47 V3/OS5 -40° to +55°C
  - Dual-Core LV:  VITA 47 V3/OS5 -40° to +70°C

EN50022 class B

EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11

- Coating standard for CP6003-RC; on request for CP6003-RA

### Ordering Information

<table>
<thead>
<tr>
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<tr>
<td><strong>CPU Boards</strong></td>
<td></td>
</tr>
<tr>
<td>CP6003-RA-Q2.1-8G-E1X</td>
<td>Quad-Core 2.1 GHz, Core i7-2715QE</td>
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<tr>
<td>CP6003-RA-2.2-4G-E1X</td>
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<td>All: Extended temperature versions on request.</td>
<td></td>
</tr>
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| **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** |             |
| KIT-CP6003          | Documentation and Windows driver kit, available on the Web |
| WXPE-BSP-CP6003     | Windows XP Embedded BSP CP6003, available on the Web |
| LIN-BSP-CP6003      | Linux BSP CP6003 for Fedora and RedHat, available on the Web |
| VXW-BSP-CP6003      | VxWorks BSP 6.x SMP support, available on the Web |

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