

» User Guide «

CP3003-SA/CP3003-V

**3U CompactPCI Processor Board based on
the 3rd Generation Intel® Core™ i7 Processor with
the Intel® QM77 Chipset**

Doc. ID: 1052-6929, Rev. 2.0
July 29, 2013



Revision History

Publication Title:		CP3003-SA/CP3003-V: 3U CompactPCI Processor Board based on the 3 rd Generation Intel® Core™ i7 Processor with the Intel® QM77 Chipset
Doc. ID:		1052-6929
Rev.	Brief Description of Changes	Date of Issue
1.0	Initial issue	14-Nov-2012
2.0	Added description for the CP3003-V	29-Jul-2013

Imprint

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ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the board is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the board.



General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the device, which are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

This device should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This applies also to the operational temperature range of the specific board version, which must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, please follow only the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board, please re-pack it as nearly as possible in the manner in which it was delivered.

Special care is necessary when handling or unpacking the product. Please consult the special handling and unpacking instruction on the previous page of this manual.



Two Year Warranty

Kontron grants the original purchaser of Kontron's products a **TWO YEAR LIMITED HARDWARE WARRANTY** as described in the following. However, no other warranties that may be granted or implied by anyone on behalf of Kontron are valid unless the consumer has the express written consent of Kontron.

Kontron warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 24 consecutive months from the date of purchase. This warranty is not transferable nor extendible to cover any other users or long-term storage of the product. It does not cover products which have been modified, altered or repaired by any other party than Kontron or their authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, improper use, incorrect handling, servicing or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

Kontron provides for repair or replacement of any part, assembly or sub-assembly at their own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to Kontron, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by Kontron with the repaired or replaced item.

Kontron will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of Kontron liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

Kontron issues no warranty or representation, either explicit or implicit, with respect to its products' reliability, fitness, quality, marketability or ability to fulfil any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will Kontron be liable for direct, indirect or consequential damages resulting from the use of our hardware or software products, or documentation, even if Kontron were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

Please remember that no Kontron employee, dealer or agent is authorized to make any modification or addition to the above specified terms, either verbally or in any other form, written or electronically transmitted, without the company's consent.



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Chapter

1

Introduction



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1. Introduction

1.1 Board Overview

The CP3003-SA is a highly integrated 3U, 4 HP CompactPCI system controller board optionally expandable to 8 HP and available either as a front I/O version or as a rear I/O version. It has been designed to support the multi-chip package, 3rd generation Intel® Core™ i7 processor combined with the mobile Intel® QM77 Express Chipset.

The board supports the Intel® Core™ i7-3612QE quad-core processor with 2.1 GHz frequency, the Intel® Core™ i7-3555LE dual-core processor with 2.5 GHz frequency and the Intel® Core™ i7-3517UE dual-core processor with 1.7 GHz frequency. All processors are built on 22-nm technology and provided in a BGA package. The processor is soldered on the CP3003-SA, which results in a higher Mean Time Between Failures (MTBF) and a significant improvement in cooling.

Two SODIMM sockets are available on the CP3003-SA to provide up to 16 GB dual-channel, DDR3 memory with Error Checking and Correction (ECC) running at 1600 MHz. The graphics controller and the memory controller are integrated in the processor. Furthermore, an external HDD/SSD and either a SATA Flash module with up to 32 GB SLC NAND flash memory or a Smart Extension Module (a SATA/USB 2.0 adapter) can be integrated onto the CP3003-SA.

The CP3003-SA comes with three Gigabit Ethernet ports, one VGA interface, two COM ports, six SATA interfaces, four USB 2.0 ports, one USB 3.0 port, two DisplayPort interfaces, and one x8 PCI Express 2.0 XMC interface. The CP3003-SA provides support for one 8 HP I/O extension module such as the CP3003-HDD or the CP3003-XMC as well as one rear I/O module such as the CP-RIO3-04.

The board supports a configurable 32-bit/ 33 MHz (66 MHz on request) PCI/PCI-X hot swap CompactPCI interface. When installed in the system slot, the interface is enabled, and when installed in a peripheral slot, the CP3003-SA is isolated from the CompactPCI bus.

The CP3003-SA further provides safety and security features via a Trusted Platform Module (TPM) 1.2.

The board fits into all applications situated in industrial environments, including I/O intensive applications where only one slot is available for the CPU, making it a perfect core technology for long-life applications. Components which have high temperature tolerance have been selected from embedded technology programs, and therefore offer long-term availability.

The board is offered with various Board Support Packages including Windows, VxWorks and Linux operating systems. For further information concerning the operating systems available for the CP3003-SA, please contact Kontron.

1.2 Board-Specific Information

The CP3003-SA is a CompactPCI single-board computer based on the 3rd generation Intel® Core™ i7 processor and specifically designed for use in highly integrated platforms with solid mechanical interfacing for a wide range of industrial environment applications.



Some of the CP3003-SA's outstanding features include:

- Support for the following 3rd generation processors:
 - Intel® Core™ i7-3612QE (SV) quad-core processor, 2.1 GHz, 6 MB L3 cache
 - Intel® Core™ i7-3555LE (LV) dual-core processor, 2.5 GHz, 4 MB L3 cache
 - Intel® Core™ i7-3517UE (ULV) dual-core processor, 1.7 GHz, 4 MB L3 cache
- Intel® QM77 Express Chipset
- Up to 16 GB, dual-channel, DDR3 SDRAM memory with ECC running at 1600 MHz on two SODIMM sockets
- Integrated 3D high-performance processor graphics controller with up to three high-resolution graphics interfaces (1x VGA and 2 x DP)
- Digital display support for resolutions up to 2560 x 1600 pixels @ 60 Hz
- Analog display support for resolutions up to 2048 x 1536 pixels @ 75 Hz
- Three Gigabit Ethernet interfaces based on three Intel® 82574L controllers:
 - Two interfaces switchable between front I/O and rear I/O (with Wake-on-LAN support)
 - One interface available on the CP3003-HDD extension module (8HP)
- Six SATA interfaces with SATA RAID 0/1/5/10 support:
 - One SATA 6 Gb/s interface for one external, standard HDD/SSD
 - One SATA 3 Gb/s interface for up to 32 GB SLC NAND flash memory via an optional SATA Flash module
 - One SATA 3 Gb/s interface for one CFast memory card (8 HP with CP3003-HDD/CP3003-XMC) or one SATA 2.5" HDD/SSD (12 HP)
 - One SATA 6 Gb/s interface for one SATA 2.5" HDD/SSD (8 HP with CP3003-HDD)
 - Two SATA 3 Gb/s interfaces for rear I/O
- Five USB ports:
 - Two USB 2.0 ports on front I/O
 - Two USB 2.0 ports on rear I/O
 - One USB 3.0 port on the 120-pin onboard high-speed I/O extension connector
- Two DisplayPort interfaces available on the CP3003-HDD extension module
- One x8 PCI Express 2.0 XMC interface available on the CP3003-XMC ex. module
- 32-bit/ 33 MHz PCI/PCI-X hot swap CompactPCI interface (PICMG 2.0); 66 MHz on request
- Compatible with CompactPCI Specification PICMG 2.0 Rev. 3.0 and usable in the system controller slot as well as in a peripheral slot (the PCI interface is isolated in peripheral slot)
- TCG 1.2-compliant Trusted Platform Module (TPM)
- Two SPI boot flashes for two separate uEFI BIOS images:
 - One standard SPI boot flash
 - One recovery SPI boot flash
- Watchdog timer
- Battery-backed real-time clock (RTC)
- One onboard DIP switch for board configuration
- Two COM ports:
 - COMA (RS-232) either on the 8 HP extension module or on the rear I/O
 - COMB (RS-232) on the rear I/O
- Peripheral extension connectors:
 - 120-pin high-speed I/O extension connector for 8 HP extension
 - 60-pin high-speed PCI Express extension connector for 8 HP extension
 - SPI extension connector
- Rear I/O on the CompactPCI connector J2
- 4 HP or 8 HP, 3U CompactPCI (12 HP on request)
- Several rear I/O configurations
- Power-up sequencing and in-rush current optimized design
- Passive heat sink solution for forced airflow cooling
- AMI Aptio®, a uEFI-compliant platform firmware



1.3 System Expansion Capabilities

1.3.1 CP3003-HDD Module (8 HP and 12 HP)

The CP3003-HDD module for the 8 HP CP3003-SA version provides various I/O ports. On the front panel, it includes two DisplayPort connectors, one Gigabit Ethernet port, one USB 3.0 port, and one RS-232 COM port. Onboard ports include one SATA connector for SATA 2.5" HDD or SSD devices as well as a CFast card socket.

As a further extension capability of the CP3003-SA to 12 HP, a SATA adapter module is available for use in conjunction with the CP3003-HDD module to provide an additional SATA connector for a 2.5" SATA HDD/SSD device. The 12 HP CP3003-SA does not provide a CFast card socket.

For further information concerning the CP3003-HDD module, refer to Appendix A.

1.3.2 CP3003-XMC Module (8 HP)

The CP3003-XMC module for the 8 HP CP3003-SA version provides one XMC mezzanine interface for support of one x8, x4 or x1 PCI Express 2.0 XMC module. In addition, the CP3003-XMC module provides a socket for CFast memory cards.

For further information concerning the CP3003-XMC module, refer to Appendix B.

1.3.3 CP-RIO3-04 Rear I/O Module

The CP-RIO3-04 rear I/O module has been designed for use with the CP3003-SA board from Kontron and provides comprehensive rear I/O functionality.

For further information concerning the CP-RIO3-04 rear I/O module, refer to Appendix C.

1.3.4 SATA Flash Module

The 4 HP CP3003-SA provides support for up to 32 GB of SLC NAND flash memory in combination with an optional SATA Flash module, which is connected to an onboard connector.

For further information concerning the SATA Flash module, refer to Appendix D.

1.3.5 Smart Extension Module

The Smart Extension Module expands the onboard I/O capability and provides one additional SATA cable connector as well as one USB 2.0 connector thereby facilitating the connection to system-internal USB and SATA devices.

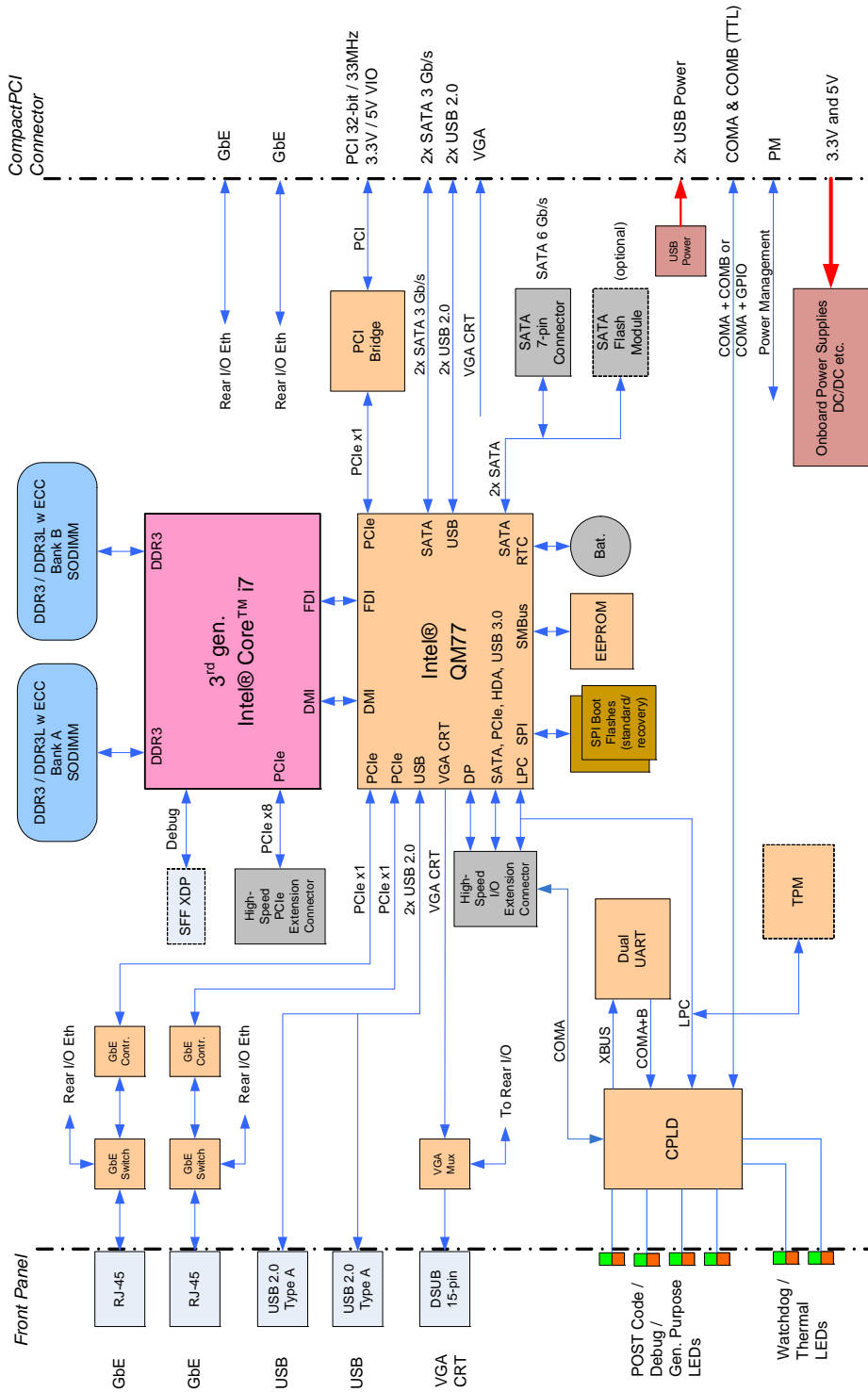
For further information concerning the SATA Flash module, refer to Appendix E.

1.4 Board Diagrams

The following diagrams provide additional information concerning board functionality and component layout.

1.4.1 Functional Block Diagram

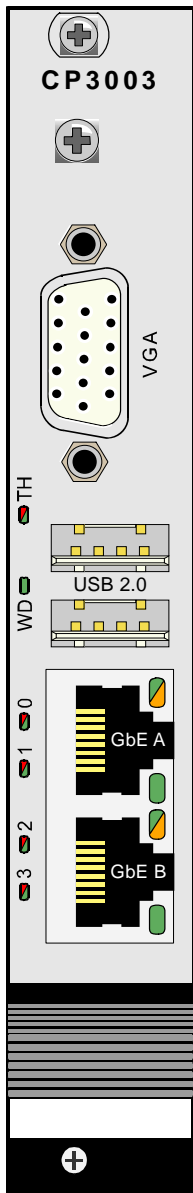
Figure 1-1: CP3003-SA Functional Block Diagram





1.4.2 Front Panel

Figure 1-2: 4 HP CP3003-SA Front Panel



Watchdog and Overtemperature Status LEDs

WD (green):	Watchdog Status
TH (red/green):	Overtemperature Status

Integral Ethernet LEDs

ACT (green):	Ethernet Link/Activity
SPEED (green/orange/off):	Ethernet Speed

General Purpose LEDs

LED0..3 (red/green/red+green): General Purpose/POST Code



Note ...

If the General Purpose LEDs 0..3 are lit red during boot-up, a failure is indicated before the uEFI BIOS has started.

Note ...



For information regarding the front panel of the 8 HP or 12 HP CP3003-SA with a CP3003-HDD module, refer to Appendix A, CP3003-HDD Module.

For information regarding the front panel of the 8 HP CP3003-SA with a CP3003-XMC module, refer to Appendix B, CP3003-XMC Module.

1.4.3 Board Layout

Figure 1-3: 4 HP CP3003-SA Board Layout (Top View)

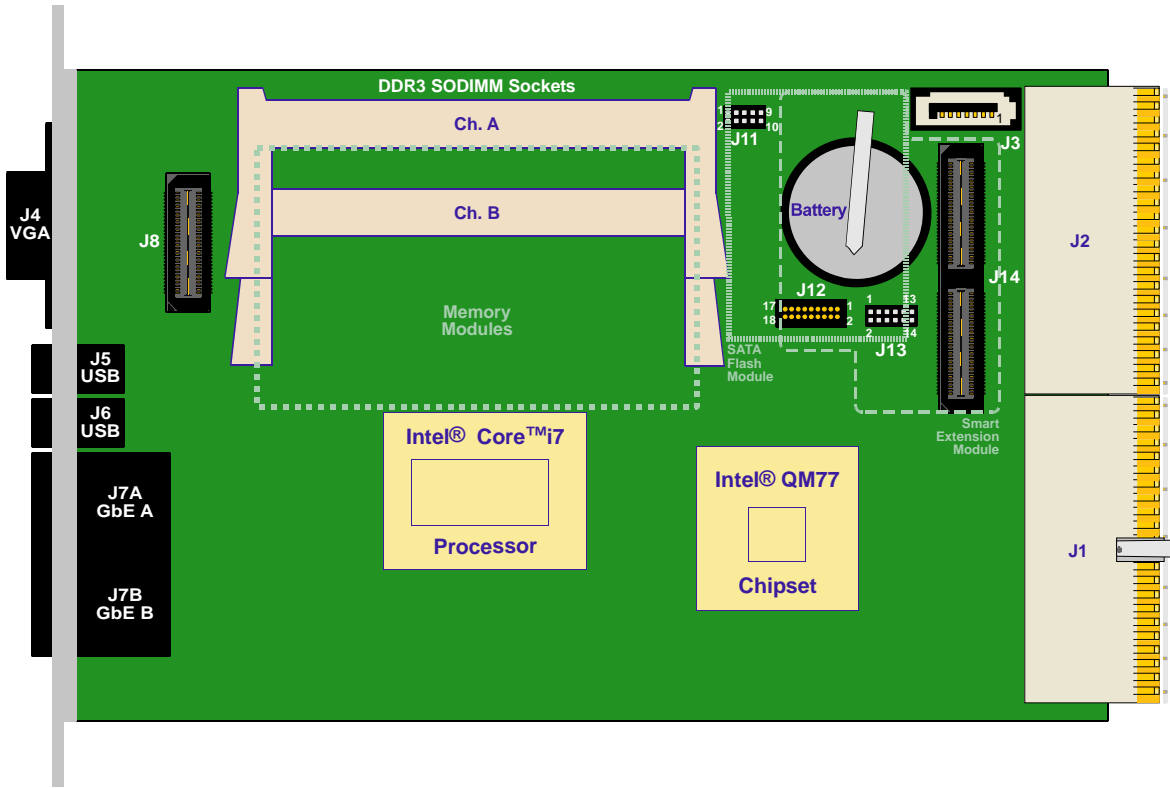


Figure 1-4: 4 HP CP3003-SA Board Layout (Bottom View)





1.5 Technical Specification

Table 1-1: CP3003-SA Main Specifications

FEATURES		SPECIFICATIONS
Processor and Memory	CPU	<p>The CP3003-SA supports the following 3rd generation microprocessors:</p> <ul style="list-style-type: none"> • Quad-core Intel® Core™ i7-3612QE (SV), 2.1 GHz, 6 MB L3 cache • Dual-core Intel® Core™ i7-3555LE (LV), 2.5 GHz, 4 MB L3 cache • Dual-core Intel® Core™ i7-3517UE (ULV), 1.7 GHz, 4 MB L3 cache <p>Further processor features used on the CP3003-SA:</p> <ul style="list-style-type: none"> • Up to four execution cores • Intel® Hyper-Threading Technology (Intel® HT Technology) • Intel® 64 Architecture • Intel® Advanced Vector Extensions (AVX) floating point • Intel® Turbo Boost Technology • System memory interface with optimized support for dual-channel DDR3 SDRAM memory at 1600 MHz with ECC • Integrated 2D and 3D Graphics Engines • DMI 2.0 with 5 GT/s and FDI interfaces to the Intel® QM77 Chipset • One x8 PCI Express 2.0 port operating at 5 GT/s <p>Please contact Kontron for further information concerning the suitability of other Intel processors for use with the CP3003-SA.</p>
	Memory	<p>Main Memory:</p> <ul style="list-style-type: none"> • Up to 16 GB, dual-channel DDR3 SDRAM memory with ECC running at 1600 MHz on two SODIMM sockets <p>Cache Structure:</p> <ul style="list-style-type: none"> • 64 kB L1 cache for each core <ul style="list-style-type: none"> • 32 kB instruction cache • 32 kB data cache • 256 kB L2 shared instruction/data cache for each core • Up to 6 MB L3 shared instruction/data cache shared between all cores <p>Flash Memory:</p> <ul style="list-style-type: none"> • Two SPI boot flash chips (2 x 8 MB) for two separate uEFI BIOS images • Up to 32 GB SLC NAND flash via an onboard SATA Flash module (SSD) <p>Serial EEPROM with 64 kbit</p>
Chipset	Intel® QM77	<p>Mobile Intel® QM77 Express Chipset features used on the CP3003-SA:</p> <ul style="list-style-type: none"> • Four x1 PCI Express 2.0 ports operating at 5 GT/s • SATA host controller with six ports and RAID 0/1/5/10 support <ul style="list-style-type: none"> • Two SATA 6 Gb/s ports • Four SATA 3 Gb/s ports • Four USB 2.0 host interfaces and up to two USB 3.0 host interfaces • Integrated Ethernet controller • SPI flash interface support • Low Pin Count (LPC) interface • Power management logic support • Enhanced DMA controller, interrupt controller, and timer functions • System Management Bus (SMBus) compatible with most I²C™ devices • DMI 2.0 with 5 GT/s and FDI interfaces to the processor • Analog display port • Two digital display ports • High Definition Audio interface • Integrated RTC

Table 1-1: CP3003-SA Main Specifications (Continued)

FEATURES		SPECIFICATIONS
Integrated Controller	Graphics Controller	<p>High-performance 3D graphics controller integrated in the processor:</p> <ul style="list-style-type: none"> • Dynamic Video Memory Technology (DVMT) • Supports digital displays with resolutions up to 2560 x 1600 pixels @ 60 Hz through DisplayPort or up to 1920x1200 pixels @ 60Hz using HDMI/DVI. HDMI/DVI displays are supported via an appropriate adapter. Refer to Chapter 2.11.4, Table 2-8 for further information on the display configuration options. • Supports analog display with resolutions up to 2048 x 1536 pixels @ 75 Hz for VGA displays
Interfaces	CompactPCI	<p>Compliant with CompactPCI Specification PICMG® 2.0 R 3.0:</p> <ul style="list-style-type: none"> • System master operation • 32-bit/33 MHz master interface (66 MHz on request) • 3.3 V or 5 V (universal PCI interface) • Support for up to seven peripheral slots (7x REQ/GNT signals) <p>When installed in a peripheral slot, the CP3003-SA is isolated from the CompactPCI bus. It receives power from the backplane and supports rear I/O.</p> <p>CP3003-SA removal under power:</p> <p>When installed in a peripheral slot, the CP3003-SA supports hot plugging on the power interface through a dedicated power controller, but not on the PCI interface.</p> <p>Hot swapping of peripheral boards controlled by the CP3003-SA:</p> <p>When installed in the system controller slot, the CP3003-SA supports the hot swapping of other boards. Individual clocks for each slot and Enum signal handling are in compliance with the PICMG 2.1 Hot Swap Specification.</p> <p>The CP3003-SA itself, however, is not hot swappable. When installed in the system controller slot, the system must be powered down in order to replace the board.</p>
	Rear I/O	<p>The following interfaces are routed to the rear I/O connector J2:</p> <ul style="list-style-type: none"> • COMA and COMB, or COMA and GPIO (all ports have 3.3V LVTTTL signaling) • 2 x USB 2.0 • VGA (analog) • 2x Gigabit Ethernet • 2x SATA 3Gb/s • System management signals • Input for 5V standby power • General purpose signals




Table 1-1: CP3003-SA Main Specifications (Continued)

FEATURES		SPECIFICATIONS
Interfaces	Gigabit Ethernet	<p>Three 10 Base-T/100 Base-TX/1000 Base-T Gigabit Ethernet interfaces based on three Intel® 82574L Ethernet PCI Express bus controllers, two interfaces individually switchable to front I/O or rear I/O, one interface available on the CP3003-HDD module:</p> <ul style="list-style-type: none"> • Dual RJ-45 connector on the front panel • Automatic mode recognition (Auto-Negotiation) • Automatic cabling configuration recognition (Auto-MDI/X) • Wake-on-LAN support available only on the two interfaces switchable to front I/O or rear I/O
	USB	<p>Five USB ports:</p> <ul style="list-style-type: none"> • Two USB 2.0 ports on the front I/O • Two USB 2.0 ports on the rear I/O interface • One USB 3.0 port on the 120-pin onboard high-speed I/O extension connector
	Serial	<p>Two 16C550-compatible UARTs:</p> <ul style="list-style-type: none"> • COMA available on the 8 HP extension module or on rear I/O • COMB or GPIO available on rear I/O only
	SATA	<ul style="list-style-type: none"> • Six SATA ports, two onboard, two on rear I/O, and two on the 8 HP extension module • Data transfer rates up to 600 MB/s • High-performance RAID 0/1/5/10 functionality on all SATA ports
	I/O Expansion Interfaces	<p>I/O expansion to 8 HP board version via the CP3003-HDD module:</p> <ul style="list-style-type: none"> • SATA 6 Gb/s • CFast (SATA 3 Gb/s) • USB 3.0 • 2x DP (DisplayPort) • COMA • Reset button and HDD/SSD activity LED • Gigabit Ethernet <p>I/O expansion to 12 HP board version via the CP3003-HDD module and the 2.5" SATA adapter module:</p> <ul style="list-style-type: none"> • 2x SATA (SATA 3 Gb/s and SATA 6 Gb/s) • USB 3.0 • 2x DP (DisplayPort) • COMA • Reset button and HDD/SSD activity LED • Gigabit Ethernet <p>I/O expansion to 8 HP board version via the CP3003-XMC module:</p> <ul style="list-style-type: none"> • PCI Express x8, x4 or x1 • CFast (SATA 3 Gb/s) <p>I/O expansion of CP3003-SA via the Smart Extension Module (exceeds 4 HP):</p> <ul style="list-style-type: none"> • SATA 3 Gb/s • USB 2.0

Table 1-1: CP3003-SA Main Specifications (Continued)

FEATURES		SPECIFICATIONS
Sockets	Front Panel Connectors	<ul style="list-style-type: none"> VGA: 15-pin D-Sub connector, J4 USB: two 4-pin, type A connectors, J5 and J6 Ethernet: dual RJ-45 connector, J7A/B
	Onboard Connectors	<ul style="list-style-type: none"> 7-pin, L-form standard SATA connector, J3 120-pin, high-speed I/O extension connector, J14 60-pin, high-speed PCI Express extension connector, J8 SPI extension connector, J11 18-pin extension connector for the SATA Flash module (SSD), J12 JTAG connector, J13 XDP-SFF (debug) connector, J15 CompactPCI connectors J1 and J2 Two 204-pin DDR3 SODIMM sockets
Switch	DIP Switch	One DIP switch, SW1, for board configuration
LEDs	LEDs	<p>Watchdog and Overtemperature Status LEDs:</p> <ul style="list-style-type: none"> WD (green): Watchdog Status TH (red/green): Overtemperature Status <p>General Purpose LEDs:</p> <ul style="list-style-type: none"> LED0..3 (red/green/red+green): General Purpose/POST Code <p>Ethernet LEDs:</p> <ul style="list-style-type: none"> ACT (green): Network/Link Activity SPEED (green/orange): Network Speed
Timer	Watchdog Timer	<ul style="list-style-type: none"> Software-configurable, two-stage Watchdog with programmable timeout ranging from 125 ms to 4096 s in 16 steps Serves for generating IRQ or hardware reset
	System Timer	<ul style="list-style-type: none"> The Intel® QM77 Chipset contains three 8254-style counters which have fixed uses In addition to the three 8254-style counters, the Intel® QM77 Chipset includes eight individual high-precision event timers that may be used by the operating system. They are implemented as a single counter each with its own comparator and value register.
Sys. Management	Thermal Management	<p>CPU and board overtemperature protection is provided by:</p> <ul style="list-style-type: none"> Up to four Digital Thermal Sensors (DTS), one for each core One Digital Thermal Sensor (DTS) for the processor graphics controller One temperature sensor integrated in the Intel® QM77 Chipset for monitoring the chipset Specially designed heat sinks
Security	TPM	Trusted Platform Module (TPM) 1.2 for enhanced hardware- and software-based data and system security

Table 1-1: CP3003-SA Main Specifications (Continued)

FEATURES		SPECIFICATIONS
Software	uEFI BIOS	AMI Aptio®, AMI's next-generation BIOS firmware based on the uEFI Specification and the Intel Platform Innovation Framework for EFI. <ul style="list-style-type: none"> • LAN boot capability for diskless systems (standard PXE) • Redundant image; fail-safe recovery in case of a damaged image • Non-volatile storage of setting in the SPI boot flash (battery only required for the RTC) • Compatibility Support Module (CSM) providing legacy BIOS compatibility based on AMIBIOS8 • Command shell for diagnostics and configuration • EFI shell commands executable from mass storage device in a Pre-OS environment (open interface)
	Operating Systems	There are various operating systems available for the CP3003-SA. For detailed information, please contact Kontron.
General	Mechanical	3U, 4 HP, CompactPCI-compliant form factor
	Power Consumption	See Chapter 5 for details.
	Temperature Range	Operational: 0°C to +60°C Standard (depending on processor version and airflow in the system) -40°C to +85°C Extended (with Intel® Core™ i7-3517UE, 1.7 GHz ULV processor only) Storage: -40°C to +85°C Without hard disk and without battery  Note ... When a battery is installed, refer to the operational specifications of the battery as this determines the storage temperature of the CP3003-SA (See "Battery" below).  Note ... When additional components are installed, refer to their operational specifications as this will influence the operational and storage temperature of the CP3003-SA.
	Battery	3.0V lithium battery for RTC with battery socket. Battery type: UL-approved CR2025 Temperature ranges: Operational (load): -20°C to +70°C typical (refer to the battery manufacturer's specifications for exact range) Storage (no load): -55°C to +70°C typical (no discharge)
	Climatic Humidity	93% RH at 40 °C, non-condensing (acc. to IEC 60068-2-78)
	Dimensions	100 mm x 160 mm  Note ... If a Smart Extension Module is installed on the CP3003-SA, the board exceeds 4 HP.
	Board Weight	313 grams (4 HP CP3003-SA with heat sink, front panel, two 2 GB SODIMM memory modules, and battery but without SATA Flash module or without Smart Extension Module respectively)



Note ...

For a description of the additional 8 HP version interfaces, refer to Appendix A, CP3003-HDD Module and Appendix B, CP3003-XMC Module.



1.6 Standards

This product complies with the requirements of the following standards.

Table 1-2: Standards

TYPE	ASPECT	STANDARD
CE	Emission	EN55022 EN61000-6-3
	Immission	EN55024 EN61000-6-2
	Electrical Safety	EN60950-1
Mechanical	Mechanical Dimensions	IEEE 1101.10
Environmental	Climatic Humidity	IEC60068-2-78 (see note below)
	WEEE	Directive 2002/96/EC Waste electrical and electronic equipment
	RoHS 2	Directive 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment



Note ...

Kontron performs comprehensive environmental testing of its products in accordance with applicable standards.

Customers desiring to perform further environmental testing of Kontron products must contact Kontron for assistance prior to performing any such testing. This is necessary, as it is possible that environmental testing can be destructive when not performed in accordance with the applicable specifications.

In particular, for example, boards **without conformal coating** must not be exposed to a change of temperature exceeding 1K/minute, averaged over a period of not more than five minutes. Otherwise, condensation may cause irreversible damage, especially when the board is powered up again.

Kontron does not accept any responsibility for damage to products resulting from destructive environmental testing.

In addition, boards ordered with the ruggedized service comply with the following standards as well.

Table 1-3: Additional Standards for Boards Ordered with Ruggedized Service

TYPE	ASPECT	STANDARD	REMARKS
Environmental	Vibration (Sinusoidal)	IEC60068-2-6	Ruggedized version test parameters: <ul style="list-style-type: none"> • 10-300 (Hz) frequency range • 5 (g) acceleration • 1 (oct/min) sweep rate • 10 cycles/axis • 3 axis
	Single Shock	IEC60068-2-27	Ruggedized version test parameters: <ul style="list-style-type: none"> • 30 (g) acceleration • 9 (ms) shock duration half sine • 3 number of shocks per direction (total: 18) • 6 directions • 5 (s) recovery time
	Permanent Shock	IEC60068-2-29	Ruggedized version test parameters: <ul style="list-style-type: none"> • 15 (g) acceleration • 11 (ms) shock duration half sine • 500 number of shocks per direction • 6 directions • 5 (s) recovery time

1.7 Related Publications

The following publications contain information relating to this product.

Table 1-4: Related Publications

PRODUCT	PUBLICATION
CompactPCI Systems	CompactPCI Specification PICMG 2.0, Rev. 3.0 CompactPCI Hot Swap Specification PICMG 2.1 Rev. 2.0
SATA	Serial ATA 1.0a Specification
CFast	CFast Specification Revision 1.0
XMC	ANSI/VITA 42.0-200x XMC Switched Mezzanine Card Auxiliary Standard ANSI/VITA 42.3-2006 XMC PCI Express Protocol Layer Standard
DisplayPort	VESA DisplayPort Standard Version 1.1a
Platform Firmware	Unified Extensible Firmware Interface (UEFI) specification, version 2.1
All Kontron products	Product Safety and Implementation Guide, ID 1021-9142



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