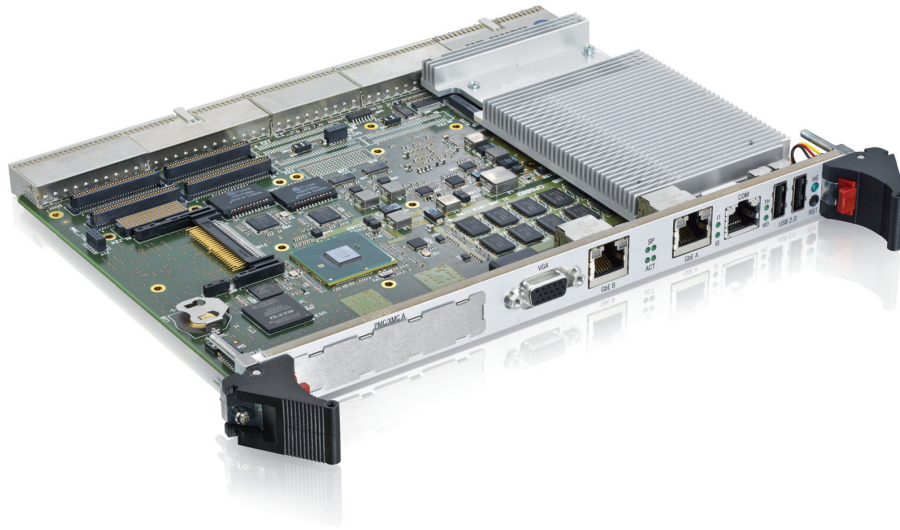# » CP6002 «

Intel® Core™ i7 Rugged 6U CompactPCI Processor Blade

» **High computing and graphic performance**

  Intel® Core™ i7 processors combined with QM57 chipset

» **Rugged Levels for demanding application requirements**

  Highly shock and vibration resistant, extended temperature range

» **Comprehensive I/O capabilities**

  4x GbE, 6x SATA with RAID, DVI & HDMI, onboard HDD, CompactFlash …

CP6002
Intel® Core™ i7 Rugged 6U CompactPCI Processor Blade

Explore the power and the potential of two 32nm cores in one processor with Kontron's CP6002 based on the Intel® Core™ i7 processor.

The CP6002, 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 processor and mobile chipset, the CP6002 features high computing and graphic performance with a low thermal power design and a complete set of data, communication and multi-media interfaces.

» Maximum Ruggedization
Designed to withstand even the toughest environmental conditions, the passively cooled CP6002 featuring up to 8 GByte of soldered RAM with ECC and a CompactFlash socket for industrial grade flash modules comes in the rugged levels – defined as R1 and R2.
The R1 version is designed for standard application requirements in air-cooled environments.
Air cooled Version R2 is available in extended temperature range from -40° C to +70° C. It is designed for high shock and vibration requirements as defined in VITA 47 EAC3/EAC6 (EAC6 requires special system components).
The CP6002 features energy efficient embedded Intel® dual core processors. With the 2.53 GHz Intel® Core™ i7-610E and the LV 2.0 GHz Intel® Core™i7-620LE, the CP6002 has extraordinary performance per watt values. Up to 8 GByte of

soldered DDR3 1066 MHz memory with ECC provide the basis for demanding software applications.
Based on the Intel® Mobile QM57 IO controller hub the CP6002 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
The CP6002 offers comprehensive I/O capability with 4 x 1Gb Ethernet, 4 x rear IO SATA with RAID 0/1/5/10 functionality, a local SATA hard disk and SATA Flash disk connector, a CompactFlash socket as well as 6 x USB 2.0, 2 x COM, VGA and/or DVI.
It can also accommodate a PMC/XMC slot and onboard 2.5" SATA HDD. A CP6002 with two PMC / XMC sockets is available for IO intensive applications.
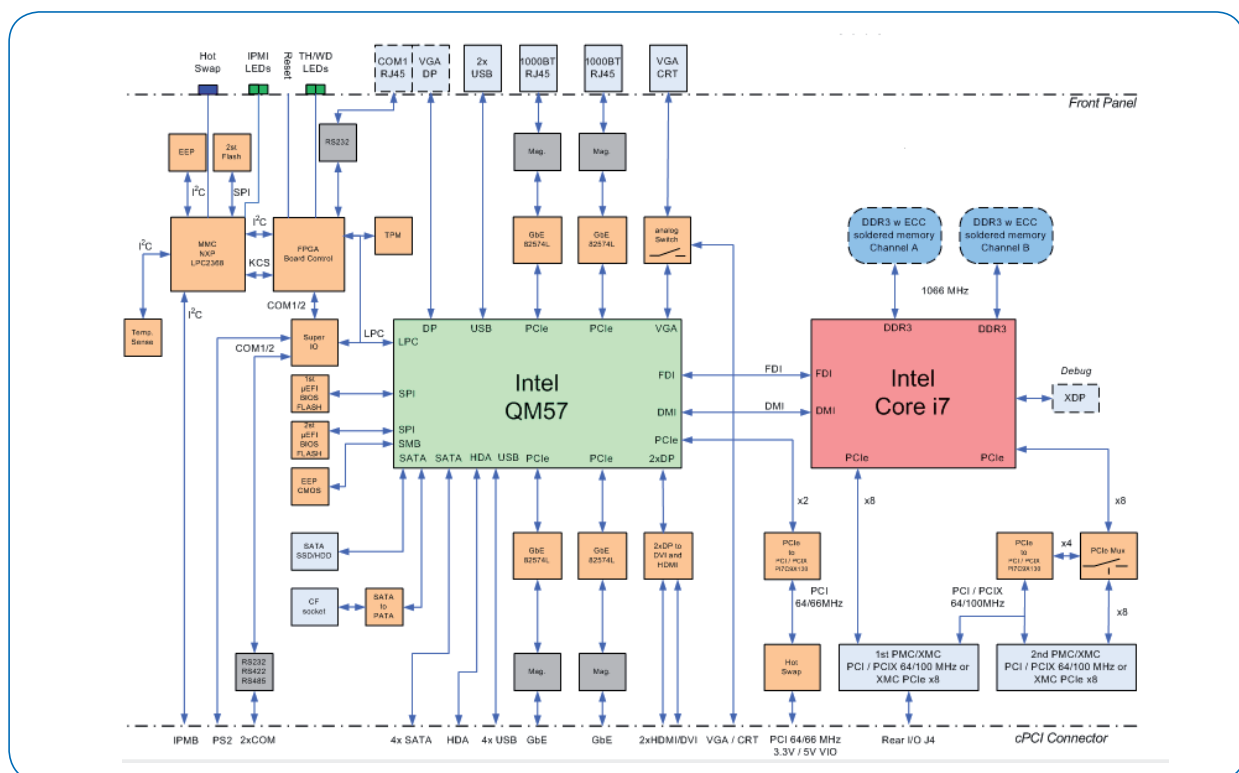The CP6002 enables construction of a highly shock and vibration resistant systems with non-rotating, nonvolatile – write protectable - memory.

» Unique Security
The board provides safety and security via a trusted platform module, (TPM) 1.2, two redundant firmware hubs (failover) and IPMI (Intelligent Platform Management Interface) support (PICMG 2.9 R1.0).

» Long-term Availability
Delivering a stable product based on Intel®'s embedded product line the CP6002 ensures long-term availability.

Technical Information

Processor	Intel® Core™ i7 Processor (32nm): » Core™ i7-610E, Dual Core, 2.53 GHz, 4 MB cache, » Core™ i7-620LE, Dual Core, 2.0 GHz, 4 MB cache, (LV) » Celeron Processor P4505, Dual Core, 2MB cache 1066 MHz dual-channel DDR-3 memory controller with ECC Note: Versions incorporating other CPUs available on project request. Please contact us for further assistance.
I/O Hub	» Intel® QM57, internal graphics controller w. dual independent graphic channels (front VGA or DVI and rear dual DVI/HDMI) » 6 SATA II controllers, 12 x USB 2.0 (6 used), 8 x PCIe 2.0 x1, 1 x LPC
Memory	» Up to 8 GByte DDR-3, 1066 MHz, with ECC, dual channel 4 or 8 GB soldered » Up to 32 GB NAND Flash module with SATA interface » CompactFlash socket (CP6002-R2: SATA flash disk only) » Two redundant 8 Mbit SPI Flash » Serial EEPROM
Onboard Controller	Four Gigabit Ethernet Intel® 82574L PCI Express bus controllers: » 2x front I/O » 2x rear I/O to support PICMG 2.16 » Watchdog: FPGA-based, software configurable, two-stage Watchdog w. programmable timeout ranging from 125 ms to 256 s in 12 steps » RTC » IPMI Controller w. Flash and RAM; ext. 1 MB SPI Flash, 64 kbit EEPROM » Super I/O: LPC Super I/O, 2x UART, HW-Monitor, fan control » Trusted Platform Module (TPM 1.2) optional
System Interconnect	» Serial ports: two COM ports (transceivers onboard) » COM1 as RS232 on front » COM2 as RS422 on the rear I/O interface » SATA NAND Flash: One SATA port of the QM57 is routed to a dedicated onboard connector, where SATA-NAND-Flash modules can be connected » SATA: Five Serial ATA II ports » Four ports are routed to rear I/O » One available as 2.5" onboard HDD (not for dual XMC versions) » PMC: one 64-bit / 66 MHz PCI PMC slot with rear I/O support or XMC (PCIe x8) slot, 5V and 3.3V PCI signalling supported » CP6002-R1/R2-MC with 2x 64-bit / 66 MHz PCI PMC slot with rear I/O support or XMC (PCIe x8) slot

Front Panel Functions

Ethernet	2 x 1000/100/10 Base Ethernet on RJ45
VGA	1 x 15-Pin D-Sub connector for standard analog displays
COM	1x RS232 UART interface on RJ45 connector
USB	2x 4-pin connectors
PMC	Opening for PMC front panel
LEDs	2x LAN activity (yellow) and speed (green), one blue control LED for hot swap, 2x for IPMI, 1x watchdog, 1x thermal control, 4-LED-field for BIOS POST code or general purpose
Reset	Reset button, guarded
Micro switch	For hot swap

I/O Table Summary (CP6002-R1)

	Front I/O	Rear I/O	Onboard Connector	Total
Video *	1	2	-	2
USB	2	4	-	6
Serial *	1	2	-	2
Ethernet *	2	2	-	4
SATA	-	4	2	6
PMC / XMC	1 or 2	J4	1/1 or 2/2	max. 2

*) Dual PMC/XMC versions with reduced front I/O

CompactPCI Bus Interface	» PICMG 2.0, 32/64-bit / 66 MHz » Universal signaling, REQ/GNT for 7 slots » Operating in system slot as system master and in peripheral slot in PCI passive mode (no communication to CPCI bus)
Rear I/O via J3/J4/J5	» J3: PICMG 2.16, VGA, COM 1/2, keyboard, mouse, USB 3-6, HDA, speaker, FAN sense » J4: PMC I/O » J5: SATA 1-4, DVI, HDMI
IPMI	IPMI 1.5 compliant
Compliancy	» CompactPCI Core Specification PICMG 2.0 Rev. 3.0 » CompactPCI Hot Swap Specification PICMG 2.1 R2.0 » 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 6100-6-2

General

Dimensions	233 x 160 x 20.5 mm, 6U, 4HP
Weight	R1: approx. 500g; R2: approx. 720g
MTBF	146178 h acc. to MIL-HDBK 217FN2, Ground Benign GB controlled at 30°C

Software Support	» APTIO EFI (BIOS) » Setup console redirection to serial port (VT100 mode) » BIOS parameters saved in Flash device » Diskless, keyboardless, videoless operation, LAN boot support » Board identification number accessible via EEPROM » Support for Windows® Server 2003, 2008, 7, XP, XP Embedded, Linux®, VxWorks® VMWare (others on request)
Power Consumption	Intel® Core™ i7 Processor (32nm): » Core™ i7-610E, 2.53 GHz: 52W max. » Core™ i7-620LE, 2.0 GHz: 42W max. » Celeron P4505, 1.86 GHz: 35W max.
Environmental	» CP6002-R1: IEC 60068-2-6/29/27 (0° to 60°C, Celeron Version +55°C, forced air cooling required) » CP6002-R2: VITA 47, EAC6 (-40° to +70°C, forced air cooling required) » Coating on request

Ordering Information

Article	Description
CPU Boards	
CP6002-R1-2.53-4G	R1-Level, Intel® Core™ i7 610E 2.53 GHz, 4MB Cache, 4GB soldered Memory, 1 PMC / XMC socket 0°C to +60°C operating temperature
CP6002-R1-2.53-8G	R1-Level, Intel® Core™ i7 610E 2.53 GHz, 4MB Cache, 8GB soldered Memory, 1 PMC / XMC socket 0°C to +60°C operating temperature
CP6002-R1-2.00-4G	R1-Level, Intel® Core™ i7 620LE 2.00 GHz, 4MB Cache, 4GB soldered Memory, 1 PMC / XMC socket 0°C to +60°C operating temperature
CP6002-R1-MC-2.00-4G	R1-Level, Intel® Core™ i7 610E 2.00 GHz, 4MB Cache, 4GB soldered Memory, 2 PMC / 2 XMC sockets 0°C to +60°C operating temperature
CP6002-R1-MC-2.53-4G	R1-Level, Intel® Core™ i7 610E 2.53 GHz, 4MB Cache, 4GB soldered Memory, 2 PMC / XMC sockets 0°C to +60°C operating temperature
CP6002-R2-MC-2.00-4G-E1x	R2-Level, Intel® Core™ i7 620E 2.00 GHz, 4MB Cache, 4GB soldered Memory, 2 PMC / XMC socket -40°C to +70°C operating temperature
CP6002-R1-1.86-4G-V	R1-Level, Intel® Celeron P4505 1.86 GHz, 2MB Cache, 4GB soldered Memory, 1 PMC / XMC socket 0°C to +55°C operating temperature
Accessories	
CP6002-MK2.5SATA	Mounting kit for 2,5" SATA-HDD onboard, mounting within 4HP
Flash-SATA or CompactFlash	various products / sizes avaliable
CABLE-GRAPHIC-DP-TO-DVI	Adapter cable DisplayPort to DVI, 19 cm
Rear Transition Modules	
CP-RIO6-001	4HP Rear I/O Module for CP6002 with 1xDVI-D; 2xUSB2.0; 2xGbE; socket for SATA 2.5" disk; headers for 2xCOM, Flash, SATA, fan
CP-RIO6-001-HD-216	4HP Rear I/O Module for CP6002 with 1xDVI-D; 2xUSB2.0; socket for SATA 2.5" disk; headers for 2xCOM, Flash, SATA, fan
CP-RIO6-B	4HP Rear I/O Module for CP6002 with 2xUSB, 2xGbE, Audio, COM1, DVI, HDMI, Connectors for USB Flash, 4x SATA, Fan, 0°C to 60°C
CP-RIO6-B-216	4HP Rear I/O Module for CP6002 with 2xUSB, Audio, COM1, DVI, HDMI, Connectors for USB Flash, 4xSATA, Fan, 0°C to 60°C, PIMG2.16 Support
CP-RIO6-A	4HP Rear I/O Module for CP6002 with 2xUSB, 2xGbE, Audio, COM1, VGA, Connectors for USB Flash, 4x SATA, Fan, 0°C to 60°C
CP-RIO6-A216	4HP Rear I/O Module for CP6002 with 2xUSB, Audio, COM1, VGA, Connectors for USB Flash, 4x SATA, Fan, 0°C to 60°C, PICMG 2.16 Support
Software Support	
KIT-CP6002	Documentation and Windows driver kit
WXPE-BSP-CP6002	Windows XP Embedded BSP CP6002
LIN-BSP-CP6002	Linux BSP CP6002 for Suse and RedHat
VXW-BSP-CP6002	VxWorks BSP 6.x SMP support
	All available on the Web

CORPORATE OFFICES

Europe, Middle East & Africa

Oskar-von-Miller-Str. 1
85386 Eching/Munich
Germany

Tel.: +49 (0)8165/ 77 777
Fax: +49 (0)8165/ 77 279

info@kontron.com

North America

14118 Stowe Drive
Poway, CA 92064-7147
USA

Tel.: +1 888 294 4558
Fax: +1 858 677 0898

info@us.kontron.com

Asia Pacific

17 Building,Block #1,ABP.
188 Southern West 4th Ring Road
Beijing 100070, P.R.China

Tel.: + 86 10 63751188
Fax: + 86 10 83682438

info@kontron.cn

(intel) Embedded Alliance Premier

www.kontron.com