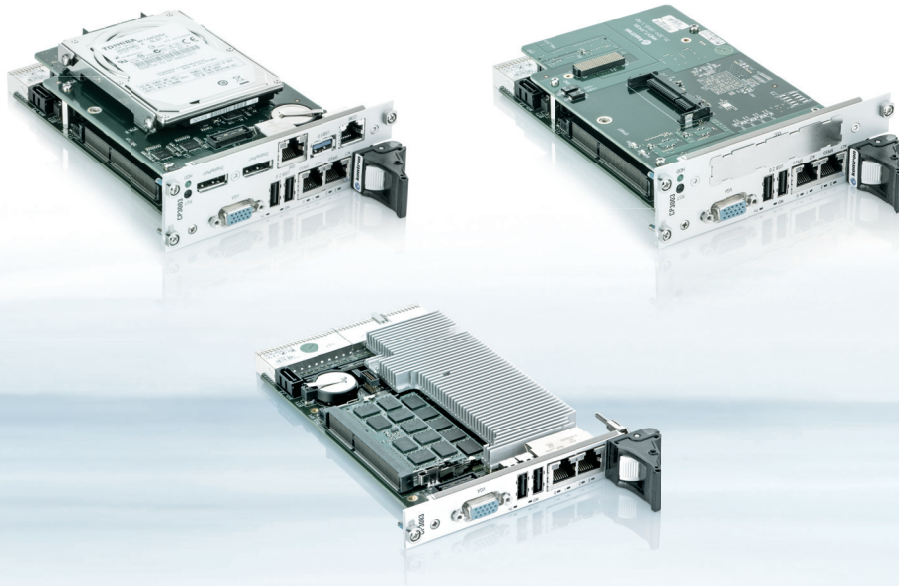# CP3003-SA

▼

3RD GEN. INTEL® CORE™ 3U COMPACTPCI CPU BOARD

▶ high-performance CPU
▶ high-end graphics
▶ high-speed connectivity

POSSIBILITIES START HERE **kontron**

CP3003-SA
3RD GENERATION INTEL® CORE™ 3U COMPACTPCI CPU BOARD

Intel®'s new 3rd Generation Core™ technology brings an unprecedented combination of highest performance and new power-saving capabilities to the embedded market. Making use of this latest technology the CP3003-SA is able to offer a new range of performance and power consumption scalability. On the one hand the CP3003-SA provides utmost performance with a quad-core CPU option, on the other hand the option to dynamically adjust the processor's TDP to a desired performance and power envelope through new CPU features such as Configurable TDP.

The CP3003-SA is available with dual- and quad-core CPU performance scalable from the ULV 1.7 GHz Intel® Core™ i7-3517UE up to the 2.1 GHz i7-3612QE processor, Intel® Celeron® processors will be offered on request. The new Intel® HD4000 graphics with integrated DirectX® 11, OpenGL 3.1 and OpenCL 1.1 support provides an up to four times better graphics performance compared to previous platform designs. Additionally, now three independent graphics outputs are supported. Memory-demanding applications can make use of up to 16GB 1600MHz DDR3 SDRAM with Error Checking and Correction (ECC). For onboard data storage the CP3003-SA offers up to 32GB on a dedicated SLC SATA Flash module or a HDD/SSD and CFast option on the 8HP extension module.

On the system side, the CP3003-SA supports a PCI 32-bit, 33MHz (66MHz on request) CompactPCI interface enabling the peripheral mode feature. When installed in a system master slot, the CompactPCI interface is enabled, whereas the CompactPCI interface will be isolated when installed in a peripheral slot.
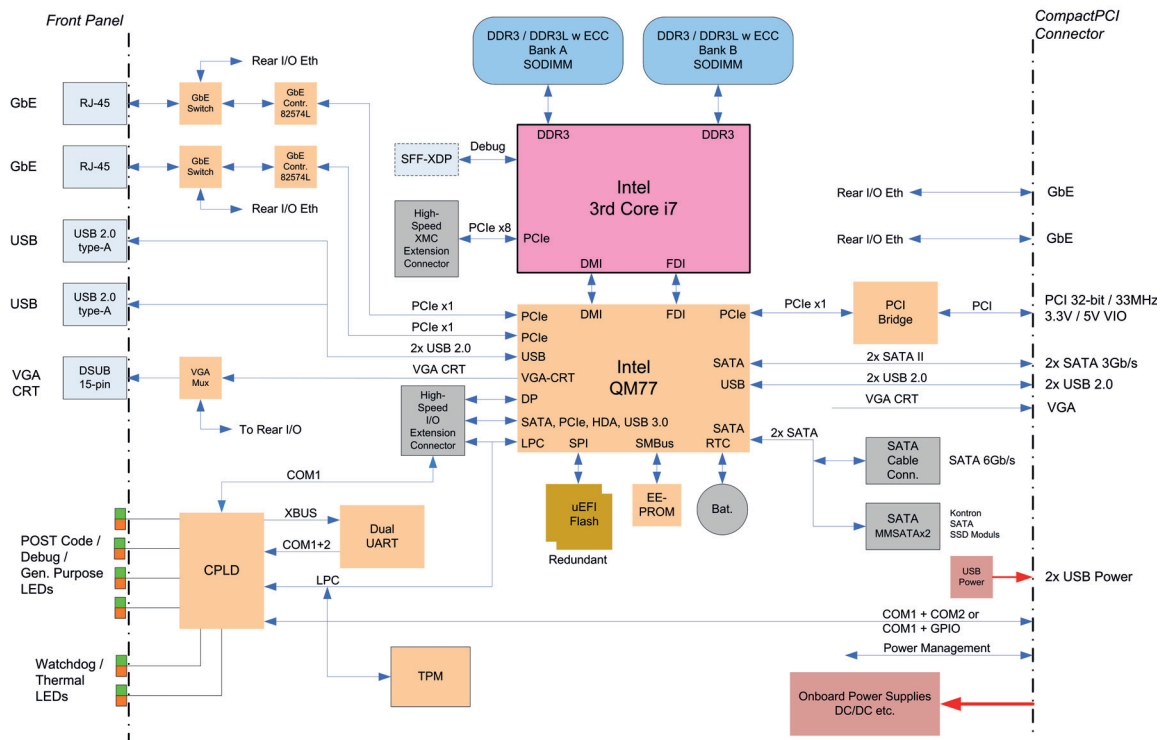
Variety of Interfaces and Options
The CP3003-SA comes with a comprehensive I/O feature set supporting known and established interfaces such as VGA, USB2.0, Gigabit Ethernet and serial ports as well as the new high-speed interfaces USB3.0 and SATA 6Gb/s. By adding one of the three extension modules - XMC Carrier, Legacy I/O or SATA/USB extension – the CP3003-SA's I/O capabilities will be further extended. Backwards compatibiliy is also granted - the optional Rear I/O interface is compatible with predecessor CPU boards.

System Security
The Trusted Platform Module (TPM) provides hardware-based encryption mechanisms to create, seal or store keys, passwords and or other crucial data.

Long-Term Availability
Investing in a new project is always a challenge and risky. Extending the lifetime of an application to the possible maximum is therefore a critical issue to save the development investments. Delivering a stable product based on Intel®'s embedded product line, the CP3003-SA ensures long-term availability. This eliminates the risk of unplanned design changes and unexpected expensive application modification. While minimizing deployment risks by providing a broad range of software support, the CP3003-SA eases the process of product integration and maximizes your competitive advantage to meet your time-to-market window.

CP3003-SA EXPANSION CAPABILITIES

▶ **TECHNICAL INFORMATION**

PROCESSOR		3rd Generation Intel® Core™ i7 processor (22nm technology):
		- i7-3612QE: Quad-Core 2.1 GHz, SV, 6MB L3 cache
		  (shared instruction/data cache, shared among all cores)
		- i7-3555LE: Dual-Core 2.5 GHz, LV, 4MB L3 cache
		  (shared instruction/data cache, shared among all cores)
		- i7-3517UE: Dual-Core 1.7 GHz, ULV, 4MB L3 cache
		  (shared instruction/data cache, shared among all cores)
		- Celeron® processor is offered on project request
		All boards are passive cooled with a heatsink in 4HP height
		Forced air cooling at specific flow rate is required depending on the processor version

MEMORY	**SYSTEM MEMORY** **BOOT FLASH (UEFI)** **EEPROM** **SATA NAND FLASH** **HDD** **CFAST**	Up to 16GB dual channel DDR3 SDRAM running at 1600 MHz, with ECC, via two SODIMM sockets Two redundant 8 MB SPI boot flashes with fail-over functionality Serial EEPROM (24LC64) 64 Kbit for storing uEFI BIOS settings and serial number Up to 32GB SLC NAND Flash on a dedicated SATA NAND Flash module The SATA NAND Flash option is only available on a 4HP CP3003-SA Onboard 2.5" SATA SSD/HDD installation via CP3003-HDD extension, optionally available with two SSD/HDD Onboard CFast installation via 8HP extension

ONBOARD CONTROLLER	**PLATFORM CONTROLLER HUB**
	
	GRAPHICS
	
	GIGABIT ETHERNET
	
	UART
	WATCHDOG
	
	RTC
	TRUSTED PLATFORM MODULE (TPM)
		Mobile Intel® QM77 Platform Controller Hub featuring:
		- USB host interface with ten USB2.0 and four USB3.0 ports
		  (only four USB2.0 and two USB3.0 ports are used on the CP3003-SA)
		- SATA host controller with four SATA 3Gb/s and two SATA 6Gb/s ports
		  with RAID 0/1/5/10 support
		- Eight x1 PCI Express 2.0 ports operating at 5.0 GT/s
		  (only four x1 PCI Express ports are used)
		- High-Definition Audio Interface
		High performance 3D graphics controller integrated in the processor:
		- Support for up to 3x independent graphics outputs
		- Supports analog display resolutions up to 2048 x 1536 pixels @ 75 Hz
		- Supports digital display resolutions up to 2560 x 1600 pixels @ 60 Hz
		- Dynamic Video Memory Technology (DVMT)
		Up to three 1000BASE-T interfaces, two front/rear switchable with WOL (Wake-on-LAN) support, third available via extension CP3003-HDD, Intel 82574L Ethernet controller
		XR16L2750IM-F, dual UART, 16C550-compatible
		FPGA-based, timeout ranging from 125ms to 4096s programmable in 16 steps, IRQ, reset, dual-stage configuration
		Integrated in PCH, with 256 Byte CMOS RAM
		Atmel AT97SC3204 TPM 1.2 controller

FRONT INTERFACES 4HP	**VGA** **USB** **ETHERNET** **LED'S**	1x VGA-CRT 15-pin D-Sub connector 2x USB 2.0 ports, 4-pin standard USB connectors 2x RJ-45 with integrated LEDs (ACT, SPEED) 6x LEDs: 4x POST Code or General Purpose, WD, TH
ONBOARD INTERFACES	**SATA CABLE CONNECTOR** **HIGH-SPEED EXTENSION CONNECTORS**	1x onboard standard 7-pin SATA connector with locking mechanism, SATA 6Gb/s 2x high-speed connectors holding: - PCI Express - One SATA 3Gb/s - One SATA 6Gb/s - 2x USB 2.0/3.0 - 2x DisplayPort - COM1 (TTL) - HDA - LPC
SATA EXTENSION CONNECTOR		1x 18-pin connector holding one SATA port for the SATA NAND Flash module
REAR I/O VIA J2		The CP3003-SA supports: - 2x SATA 3Gb/s ports - 2x Gigabit Ethernet ports without LED signals - 2x USB 2.0 ports - 1x VGA analog port - 2x COM port RS-232 (LVTTL signal level) - 5x GPIs and 3x GPOs (LVTTL signal level) - Reset and Power Management signals - Option to write protect non-volatile RAMs via a special pin

COMPACTPCI BUS INTERFACE		PICMG 2.0 Rev. 3.0 compatible, 32-bit/33MHz (66MHz on request), version with rear I/O via J2 Universal 5V and 3.3V PCI signalling voltage supported, 7 Req/Gnt & clock lines Operating in system slot as system master and in peripheral slot in PCI passive mode
HOT SWAP		Support for all signals to allow peripheral boards to be hot swapped. The individual clocks for each slot and access the backplane ENUM# signal comply with the PICMG 2.1 Hot Swap Specification
SUPERVISORY FUNCTIONS		Watchdog, software configurable, 125ms to 4096s in 16 steps, generates IRQ or hardware reset or dual-stage configuration
SOFTWARE SUPPORT		- AMI uEFI, setup console redirection to serial port (VT100 mode) with CMOS setup access, EFI Shell support, board configuration via Shell, diskless, keyboardless, videoless operation - LAN boot support - Board identification number accessible via EEPROM - Support for Windows® XP, Windows® 7, Windows® Embedded Standard 7, Windows® Server 2003/2008, Linux, VxWorks®, QNX® (Other OSs may also be used with the CP3003. Please contact Kontron for further information)
COMPLIANCY		- CompactPCI Core Specification PICMG 2.0 Rev. 3.0 - CompactPCI Hot Swap Specification PICMG 2.1 Rev. 2.0 Designed to meet or exceed: - Safety: UL 60950-1, CSA 22.2 No 60950, EN 60950-1, IEC 60950-1 - EMI/EMC: EN 55022 / EN 55024, EN 61000-6-3 / EN 61000-6-2
GENERAL	DIMENSIONS WEIGHT MTBF	3U 4HP/8HP/12HP CompactPCI, 100 x 160 mm CP3003-SA 4HP: 320 g 274,266 h acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30°C
POWER CONSUMPTION		CP3003-SA with i7-3555LE DC 2.5 GHz typ. 21W CP3003-SA with i7-3612QE QC 2.1 GHz typ. 29W
ENVIRONMENTAL	OPERATING TEMPERATURE STORAGE TEMPERATURE CLIMATIC HUMIDITY	0°C to +60°C, standard -40° to +85°C, extended temp. E2 (with ULV processor) -40°C to +85ºC (without additional components) 93% RH at 40°C, non-condensing (acc. to IEC 60068-2-78)

CP3003-SA EXPANSION CAPABILITIES

The CP3003-SA provides various expansion capabilities via specifically designed modules such as the SATA Flash Module, the Smart Extension Module, the CP3003-HDD module and the CP3003-XMC module. The 4HP CP3003-SA can accommodate two modules, the SATA Flash Module and the Smart Extension module. The SATA Flash Module is available with up to 32 GB SLC NAND flash memory and can be used as storage device for onboard data or operating system data. The SATA Flash Module is specifically designed and optimized for embedded systems providing high performance, reliability and security. The Smart Extension Module expands the onboard I/O capability and provides one additional SATA cable connector plus one USB 2.0 connector thereby facilitating the connection to system-internal USB and SATA devices. Furthermore, two extension modules are available to expand the CP3003-SA to a double-slot 8HP version, the CP3003-HDD module and the CP3003-XMC module.

If more interfaces to the front are needed, the CP3003-HDD is the right choice. This module provides one USB 3.0 port, one Gigabit Ethernet interface, two DisplayPorts, and one COM interface on the front panel. In addition, the CP3003-HDD module provides support for a 2.5" SATA HDD/SSD and a CFast card. As a further extension capability of the CP3003-SA to 12HP, a SATA adapter module is available with the CP3003-HDD to provide an additional SATA connector for 2.5" SATA HDD/SSD devices. The 12 HP CP3003-SA does not provide a CFast socket.

The CP3003-XMC module provides one x8 (or less) PCI Express 2.0-compliant interface with up to 5 GT/s for one XMC module. In addition, the CP3003-XMC module is capable of accommodating a CFast card.
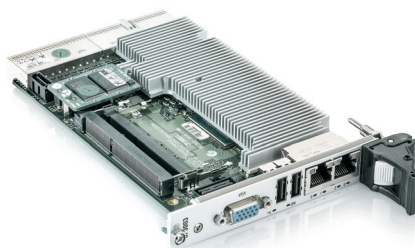
SATA FLASH MODULE

▶ TECHNICAL INFORMATION

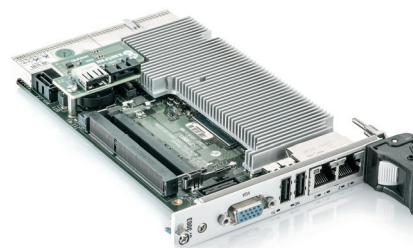| MEMORY	CAPACITY NAND FLASH MEMORY BANDWITH	Up to 32 GB SLC-based NAND Flash memory 32nm Toshiba Single Level Cell Components Up to 60 MB/s read rate Up to 55 MB/s write rate
GENERAL	DIMENSIONS WEIGHT MTBF POWER CONSUMPTION	38 x 27mm Ca. 7 grams 3,848,557 h acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30°C Typ. 0.5W, 3.3V supply
ENVIRONMENTAL	OPERATING TEMPERATURE STORAGE TEMPERTURE CLIMATIC HUMIDITY	0°C to +60°C, standard -40°C to +85°C, extended temperature -40°C to +85ºC 93% RH at 40°C, non-condensing (acc. to IEC 60068-2-78)

SMART EXTENSION MODULE

▶ TECHNICAL INFORMATION

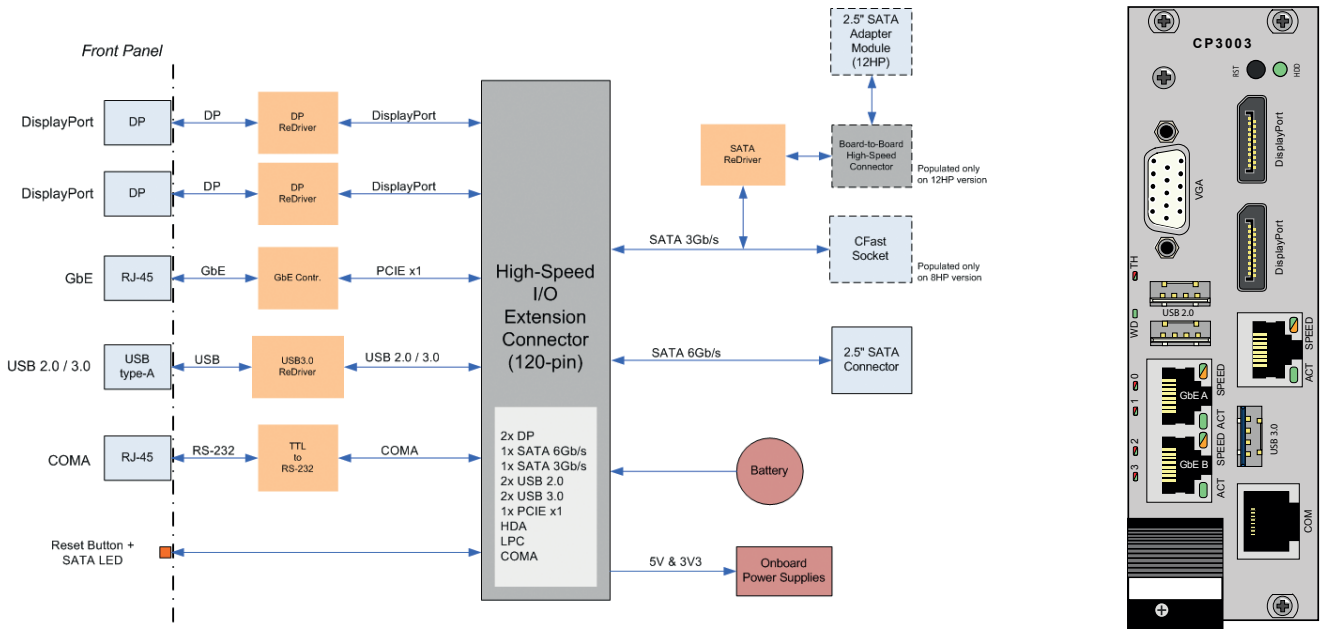| ONBOARD INTERFACES	SATA USB	One onboard angled standard SATA connector One onboard angled standard USB 2.0 connector
GENERAL	DIMENSIONS WEIGHT MTBF	34 x 49 mm Ca. 11 grams 6,534,579 h acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30°C
ENVIRONMENTAL	OPERATING TEMPERATURE STORAGE TEMPERTURE CLIMATIC HUMIDITY	0°C to +60°C, standard -40°C to +85°C, extended temperature -40°C to +85ºC 93% RH at 40°C, non-condensing (acc. to IEC 60068-2-78)

// CP3003-SA WITH SATA FLASH MODULE

// CP3003-SA WITH SMART EXTENSION MODULE

CP3003-HDD

Front Panel

▶ **TECHNICAL INFORMATION**

FRONT INTERFACES (8HP)	DISPLAYPORT ETHERNET USB SERIAL PORT CONTROL	2x 20-pin DisplayPort connectors, DVI/HDMI capable through passive cable adapter 1x RJ-45 with integrated LEDs (ACT, SPEED) 1x USB 3.0 port, 9-pin type-A connector 1x 16C550-compatible serial port, RS232 signalling, RJ-45 Reset button and HDD activiy LED
ONBOARD INTERFACES	SATA CFAST	1x SATA connector for connecting a SATA 2.5" HDD/SSD (SATA 6Gb/s), Option to add 2nd SATA HDD/SSD (results in 12HP stacking height and CFast socket won't be available) 1x CFast card socket
GENERAL	WEIGHT MTBF POWER CONSUMPTION	CP3003-SA 8HP: 460 g, CP3003-SA 12HP: 520 g 1,120,458 h acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30°C typ. 0.5W, without peripheral devices connected
ENVIRONMENTAL	OPERATING TEMPERATURE STORAGE TEMPERTURE CLIMATIC HUMIDITY	0°C to +60°C, standard -40°C to +85°C, extended temperature -40°C to +85ºC (without additional components) 93% RH at 40°C, non-condensing (acc. to IEC 60068-2-78)

// CP3003-SA 12HP

▶ ORDERING INFORMATION

ARTICLE	DESCRIPTION
CP3003-SA CONFIGURATIONS	
CP3003-SA-2.1Q-8-4F-T	Core i7-3612QE, Quad-Core 2.1GHz, 6MB L3, 8GB (2x 4GB) SODIMM DDR3 with ECC, 4HP, Front I/O, with TPM
CP3003-SA-2.1Q-8-4R-T	Core i7-3612QE, Quad-Core 2.1GHz, 6MB L3, 8GB (2x 4GB) SODIMM DDR3 with ECC, 4HP, Rear I/O, with TPM
CP3003-SA-2.1Q-8-8R-T	Core i7-3612QE, Quad-Core 2.1GHz, 6MB L3, 8GB (2x 4GB) SODIMM DDR3 with ECC, 8HP with CP3003-HDD, Rear I/O, with TPM
CP3003-SA-2.5D-4-8F-T	Core i7-3555LE, Dual-Core 2.5GHz, 4MB L3, 4GB (2x 2GB) SODIMM DDR3 with ECC, 8HP with CP3003-HDD, Front I/O, with TPM
CP3003-SA-2.5D-8-8R-T	Core i7-3555LE, Dual-Core 2.5GHz, 4MB L3, 8GB (2x 4GB) SODIMM DDR3 with ECC, 8HP with CP3003-HDD, Rear I/O, with TPM
CP3003-SA-2.5D-8-8XR-T	Core i7-3555LE, Dual-Core 2.5GHz, 4MB L3, 8GB (2x 4GB) SODIMM DDR3 with ECC, 8HP with CP3003-XMC, Rear I/O, with TPM
CP3003-SA-1.7D-4-4F-E2-T	Core i7-3517UE, Dual-Core 1.7GHz, 4MB L3, 4GB (2x 2GB) SODIMM DDR3 with ECC, 4HP, Front I/O, extended temp. E2, with TPM
CP3003-SA-1.7D-8-8R-E2-T	Core i7-3517UE, Dual-Core 1.7GHz, 4MB L3, 8GB (2x 4GB) SODIMM DDR3 with ECC, 8HP with CP3003-HDD, Rear I/O, extended temp. E2, with TPM
FLASH STORAGE	(as separate items, not mounted on the CPU)
FLASH-SATA-XGB-CP3002/ CP3003	SATA NAND Flash module, various sizes available
CFASTX	Industrial grade CFast, various sizes available
REAR TRANSITION MODULES	
CP-RIO3-04	4HP rear I/O module (2x Ethernet, 2x USB, VGA, 2x SATA connectors)
CP-RIO3-04	8HP rear I/O module (additional to 4HP COM1/2)
CP-RIO3-04S	4HP rear I/O module (2x Ethernet, COM, VGA, 2x SATA connectors)
SOFTWARE	
VXW-BSP-CP3003-SA-V6.9.2	VxWorks 6.9.2 Board Support Package
QNX-BSP-CP3003-SA-V6.5	QNX6.5 Board Support Package
NOTES:	» Windows and Linux BSPs are only available as download on the web page » The SATA NAND Flash module cannot be used in conjunction with the CP3003-HDD/CP3003-XMC module

Please contact your local sales representative for other configuration options.

▶ CORPORATE OFFICES

EUROPE, MIDDLE EAST & AFRICA

Lise-Meitner-Str. 3-5
86156 Augsburg
Germany
Tel.: + 49 821 4086 0
Fax: + 49 821 4086 111
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

1~2F, 10 Building, No. 8 Liangshuihe 2nd Street,
Economical & Technological Development Zone,
Beijing, 100176, P.R.China
Tel.: +86 10 63751188
Fax: +86 10 83682438
info@kontron.cn

www.kontron.com