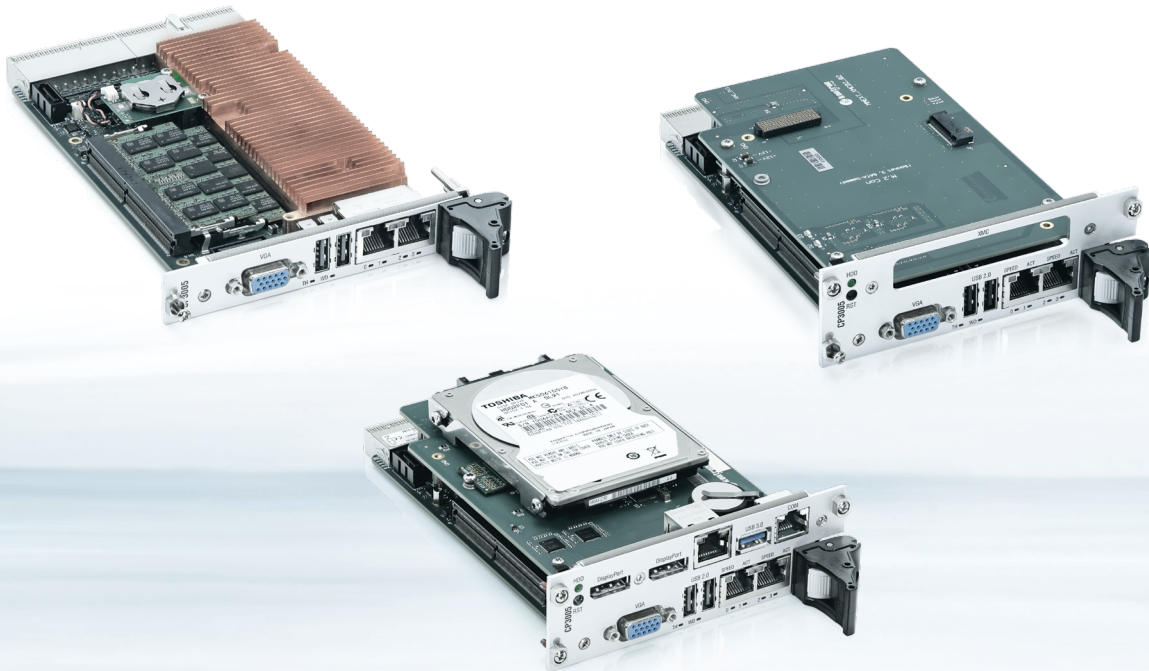


# CP3005-SA

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## 3U CompactPCI CPU Board with 8th/9th Gen Intel® Core™ and Xeon® for Industrial Control, Defense, Oil&Gas, Mining

- ▶ More performance-per-watt with up to 6 cores
- ▶ Long term programs: 10 years or more
- ▶ Expansions for I/O, storage, XMC, M.2 flash
- ▶ Rugged VITA47 EAC3, extended temperature

POSSIBILITIES START HERE



# CP3005-SA

## 8th/9th Gen Intel® Core™ 3U CompactPCI CPU Board

- ▶ **Performance-per-watt**  
Intel® Core™ i7/i5 and Intel® Xeon® version up to 6 cores
- ▶ **4K video experience**  
Intel® UHD Graphics P630  
Frequency 350 MHz base, > 1 GHz max.  
DirectX® 12 and OpenGL 4.5
- ▶ **Flash capacities**  
30 – 512 GByte M.2 SATA flash even good for mass storage
- ▶ **Memory bandwidth**  
32/16/8 GByte dual-channel up to 2666 DDR4 speeds,  
ECC option
- ▶ **Connectivity**  
USB 3.0, SATA 6Gbit/s, PCI Express®,  
3x Gbit Ethernet/WOL
- ▶ **Variety of Extensions**  
Mezzanines for 2.5" HDD/SSD, XMC, second M.2 SATA module  
Rear I/O, backward compatible
- ▶ **Robustness**  
Temperature option -40 °C up to +70 °C  
Designed for VITA47 EAC3
- ▶ **Security**  
Hardware based encryption / TPM2.0  
Digital rights management (option, WIBU Systems technology)

CP3005-SA is the perfect choice for high performance applications, with an improved performance-per-watt compared to predecessors. The single-slot master CPU cards are based on 8th/9th Gen Intel® Core™ processors, with two up to six cores: Intel® Xeon® is perfect for high performance applications, especially for server platforms, Core™ i5 and i3 for any kind of industrial applications. Combined with Intel® UHD Graphics 630, CP3005-SA provides a new level of graphics performance compared to previous platform designs.

CP3005-SA is built to be used in demanding and harsh environments. It is designed for VITA47 EAC3 and a temperature range of -40 °C up to +70 °C. The processor's TDP can be adjusted dynamically to a desired performance and power envelope. The maturity and future-openness of the CompactPCI formfactor is proven in all ECT markets. Typical applications can be found in:

- ▶ Defense
- ▶ Industrial Plant Control, Machine Control
- ▶ Energy, Oil&Gas, Mining
- ▶ Transportation

### Revolutionary flash capacities and doubled memory

Up to 32 GByte SDRAM of 2666 DDR4 speeds serve applications with high memory demands. Error Checking and Correction (ECC) is supported.

Thanks to the formfactor M.2, revolutionary flash capacities of up to 512 GByte at 22x42 mm module size are market-available and enable use even for mass storage! Qualified M.2 SATA Flash modules are available as CP3005-SA accessories by Kontron.

### Variety of Interfaces and Options

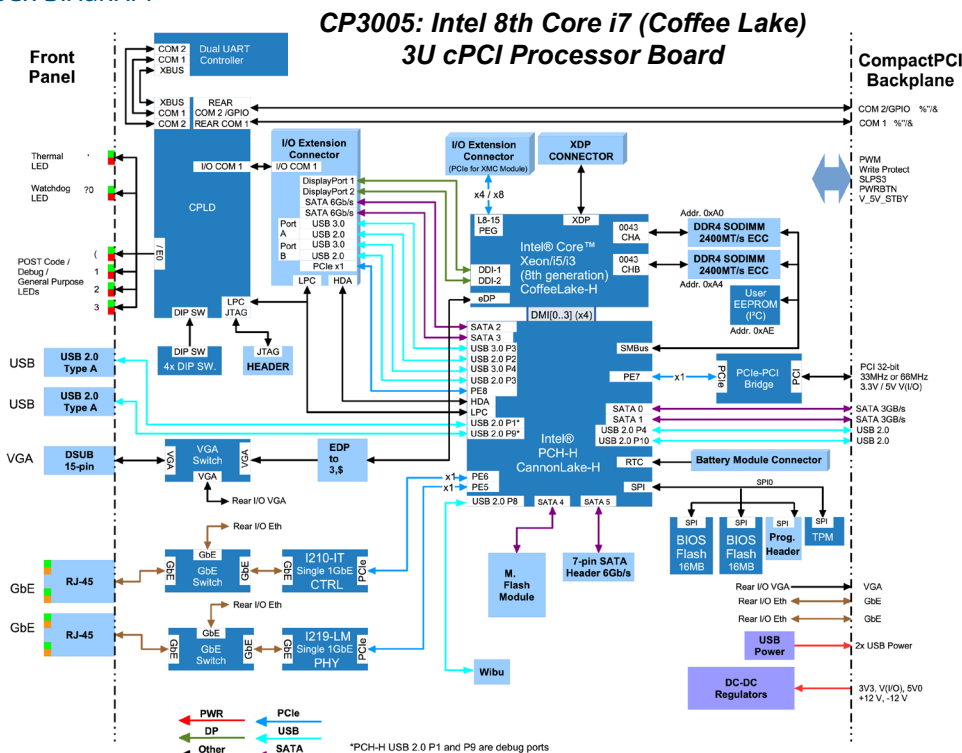
The CP3005-SA comes with a comprehensive I/O feature set supporting up to three graphic ports VGA and 2x DVI, several USB 2.0 and 3.0, Gigabit Ethernet with Wake-over-LAN (WOL) option. Backwards compatibility is also granted - the optional Rear I/O interface is compatible with previous CPU board series, so that Kontron's available Rear Transition Modules can be re-used. Expansion options are provided to carry a XMC module, or a 2.5" HDD or SSD, and another M.2 SATA SSD module of 80mm size. PCI passive mode to run in peripheral slots, opens the door for Multi-CPU systems.

### Security

CP3005-SA is equipped with a Trusted Platform Module (TPM 2.0) for enhanced hardware and software based data and system security, such as secure boot and trusted boot. TPM access is disabled by default. CP3005-SA is ready to be used for Digital Rights Management based on Wibu-Systems CodeMeter®. On request, a respective CP3005 assembly option provides the security chip soldered on the PCB.

**10 years lifetime of CP3005-SA or even more, and Kontron's commitment to a rich CompactPCI portfolio, make CP3005-SA a safe investment with low total-cost-of-ownership.**

► BLOCK DIAGRAM



► TECHNICAL INFORMATION

<p><b>PROCESSOR</b></p>		<p>8th Gen Intel® processor (14nm technology):</p> <ul style="list-style-type: none"> <li>- Intel® Xeon® E-2176M, 6-Core, 2.7 GHz (base), 4.4 GHz (max), with ECC, 12 MByte Cache</li> <li>- Intel® Core™ i5-8400H, 4-Core, 2.5 GHz (base), 4.2 GHz (max), no ECC, 8 MByte Cache</li> <li>- Others may be following</li> </ul> <p>9th Gen Intel® processor (14nm technology):</p> <ul style="list-style-type: none"> <li>- Intel® Xeon® E-2276ML, 6-Core, 2.0 GHz, with ECC, 12 MB Cache, 25 W TDP</li> <li>- Intel® Core™ i3-9100HL, 4-Core, 1.6 GHz (base), 2.9 GHz (max), with ECC, 6 MB Cache, 25 W TDP</li> </ul> <p>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</p>
<p><b>MEMORY</b></p>	<p><b>SYSTEM MEMORY</b></p> <p><b>BOOT FLASH (UEFI)</b></p> <p><b>SATA FLASH</b></p> <p><b>HDD</b></p>	<p>Up to 32 GByte dual channel DDR4 SDRAM at 2400 MT/s, via two SODIMM sockets, ECC support by Intel® Xeon® only</p> <p>Two redundant 16 MByte SPI boot flashes with fail-over functionality</p> <p>M.2 socket for 2242 M.2 SATA modules, enabling 32 GByte up to 512 GByte flash capacity, available for 4HP and 8HP variants of CP3005-SA.</p> <p>M.2 socket for 2280 M.2 SATA modules, enabling 32 GB up to 1 TB flash capacity, on 8HP extensions</p> <p>Onboard 2.5" SATA SSD/HDD installation on 8HP variants via CP3005-HDD extension</p>
<p><b>ONBOARD CONTROLLER</b></p>	<p><b>PLATFORM CONTROLLER HUB</b></p> <p><b>GRAPHICS</b></p> <p><b>GIGABIT ETHERNET</b></p> <p><b>UART</b></p> <p><b>WATCHDOG</b></p> <p><b>RTC</b></p> <p><b>TRUSTED PLATFORM MODULE (TPM)</b></p> <p><b>WIBU</b></p>	<p>Mobile Intel® QM370 Platform Controller Hub (Core branded CPU's)</p> <p>Mobile Intel® CM246 Platform Controller Hub (Xeon branded CPU's)</p> <p>Both featuring:</p> <ul style="list-style-type: none"> <li>- PCI Express® max. 20 resp. 24 lanes with x1, x2, x4 configurations</li> <li>- USB host interface with 14 ports USB 3.1/2.0</li> <li>- SATA 6.0 Gb/s max. 4 ports with RAID 0/1/5/10 support</li> </ul> <p>Intel® UHD Graphics P630 integrated</p> <ul style="list-style-type: none"> <li>- up to 3x independent graphics outputs</li> <li>- Supports DirectX® 12 and OpenGL 4.5</li> </ul> <p>Maximum resolutions</p> <ul style="list-style-type: none"> <li>- VGA with a CRT monitor: tbd</li> <li>- VGA with a LCD monitor: tbd</li> <li>- DisplayPort: 4096 x 2304 pixels @ 60 Hz</li> </ul> <p>Intel® i210 and i219LM Ethernet controller: Up to three 1000BASE-T interfaces, two front/rear switchable with WOL (Wake-on-LAN), third available via 8HP extension CP3005-HDD</p> <p>dual UART, EXAR XR16L2750</p> <p>FPGA-based, timeout ranging from 125ms to 4096s programmable in 16 steps, IRQ, reset, dual-stage configuration</p> <p>Integrated in PCH, with 256 Byte CMOS RAM</p> <p>Infineon SLB9670 TPM 2.0 controller</p> <p>WIBU CodeMeter for Kontron APPROTECT (assembly option on request)</p>

## ▶ TECHNICAL INFORMATION

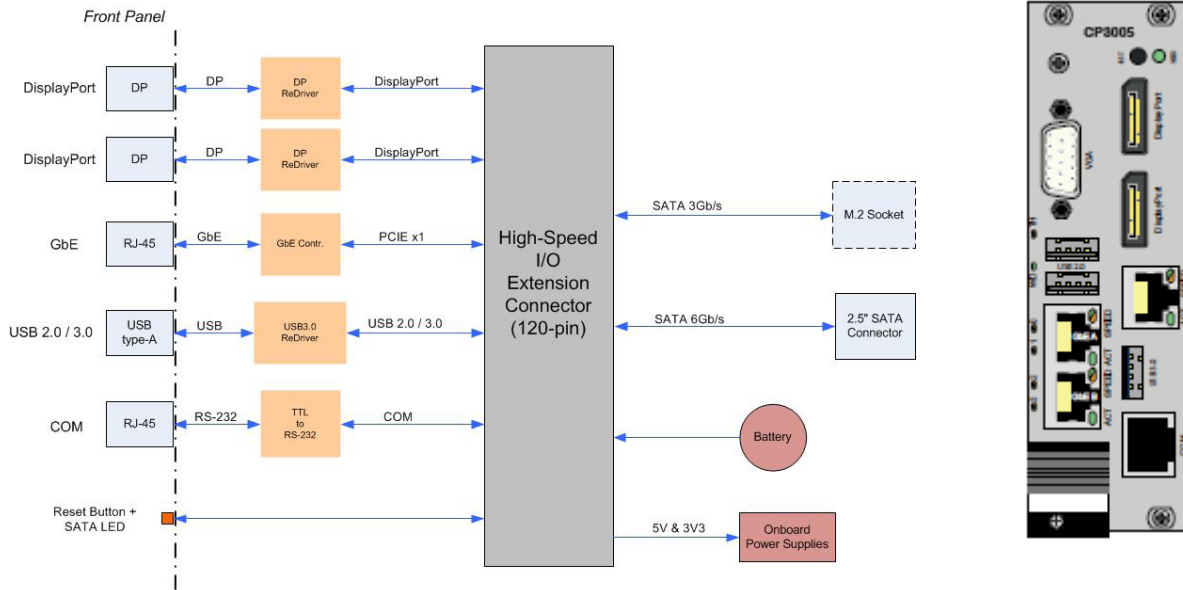
<b>FRONT INTERFACES 4HP</b>	<b>VGA USB ETHERNET LED'S</b>	1x VGA-CRT 15-pin D-Sub connector 2x USB 2.0 ports, 4-pin standard USB connectors 2x RJ-45 with integrated LEDs (ACT, SPEED) 6x LEDs: 4x POST Code or General Purpose, WD, TH
<b>ONBOARD INTERFACES</b>	<b>SATA CABLE CONNECTOR  SATA EXTENSION CONNECTOR HIGH-SPEED EXTENSION  CONNECTORS</b>	1x onboard standard 7-pin SATA connector with locking mechanism, SATA 6Gb/s M.2 connector holding one SATA port for a M.2 SATA 2242 Flash module 2x high-speed connectors (used for expansion mezzanines of 8HP boards), holding: - PCI Express® - One SATA 3Gb/s - One SATA 6Gb/s - 2x USB 2.0/3.0 - 2x DisplayPort - COM1 (TTL) - HDA - LPC
<b>REAR I/O VIA J2</b>		- 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 (LVTTTL signal level) - 5x GPIs and 3x GPOs (LVTTTL signal level) - Reset and Power Management signals - Option to write protect non-volatile RAMs via a special pin
<b>COMPACTPCI BUS INTERFACE</b>		PICMG 2.0 Rev. 3.0 compatible, 32-bit/33MHz (66MHz on request), rear I/O version 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
<b>SUPERVISORY FUNCTIONS</b>		Watchdog, software configurable, 125ms to 4096s in 16 steps, generates IRQ or hardware reset or dual-stage configuration
<b>SOFTWARE SUPPORT</b>		- 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® 10 IoT Enterprise LTSB 2016 (64 bit), Windows® Server 2016, Linux, VxWorks® 7.x (Other OSs may also be used with the CP3005. Please contact Kontron)
<b>COMPLIANCY</b>	<b>CompactPCI  SAFETY  EMC/EMI</b>	PICMG 2.0 Rev. 3.0 (core specification) PICMG 2.1 Rev. 2.0 (hot swap specification) EN 62368-1 Designed to meet or exceed: IEC 62368-1, UL 60950-1, CSA 22.2 No 60950 EN 55032, EN 61000-6-3 EN 55024, EN 61000-6-2
<b>GENERAL</b>	<b>DIMENSIONS WEIGHT MTBF</b>	3U 4HP/8HP CompactPCI, 100 x 160 mm CP3005-SA 4HP: 320 g 170.000 hrs (4HP), 144.000 hrs (8HP) acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30 °C
<b>POWER CONSUMPTION</b>		CP3005-SA with Xeon® E-2176M: typ. W tbd CP3005-SA with Core™ i5-8400H: typ. W tbd
<b>ENVIRONMENTAL</b>	<b>OPERATING TEMPERATURE  STORAGE TEMPERATURE CLIMATIC HUMIDITY</b>	0 °C to +60 °C, standard -40 ° to +70 °C, extended temp. -40 °C to +85 °C (without additional components) 93 % RH at 40 °C, non-condensing (acc. to IEC 60068-2-78)

## ▶ CP3005-SA EXPANSION CAPABILITIES

Two expansion mezzanines, the CP3005-HDD module and the CP3005-XMC module, are available as part of respective 8HP size CP3005-SA variants. The CP3005-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 CP3005-XMC module is capable of accommodating a M.2 SATA Solid State Drive of 22 x 80 mm size, enabling 32 Gigabyte up to 1 TByte flash capacity.

If more interfaces to the front are needed, the CP3005-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 CP3005-HDD module provides support for a 2.5" SATA HDD or SSD and a M.2 SATA Solid State Drive of 22 x 80 mm size.

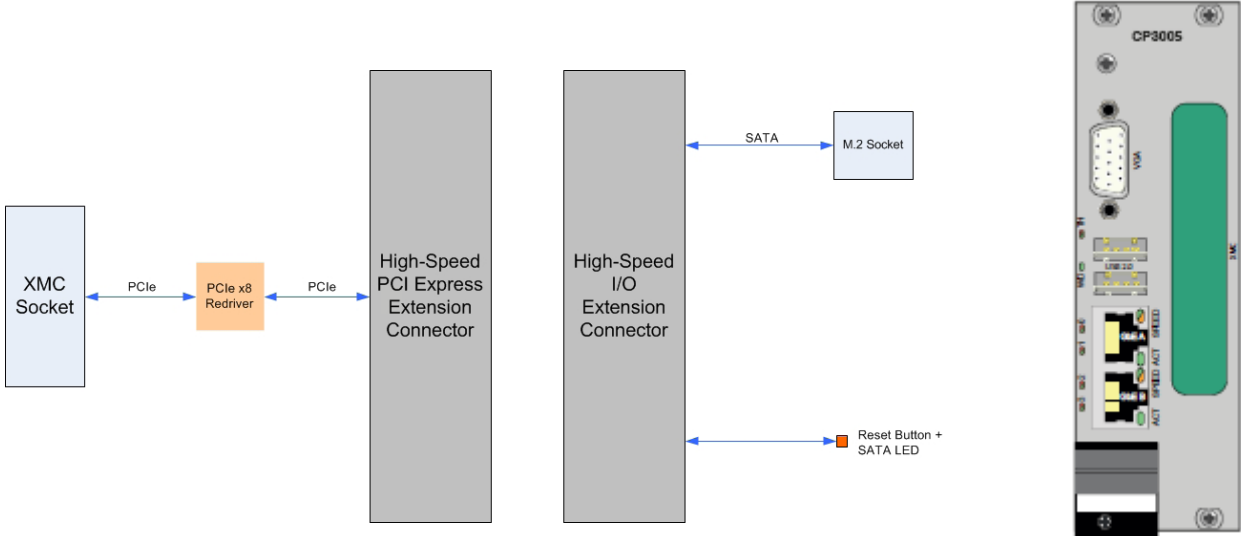
# CP3005-HDD



## TECHNICAL INFORMATION

<b>FRONT INTERFACES 8HP</b>	<b>DISPLAY PORT</b>	Support of Multi Stream Transport for 3 independent DP outputs 2x 20-pin DisplayPort connectors, DVI/HDMI capable through passive cable adapter
	<b>ETHERNET</b>	1x RJ-45 with integrated LEDs (ACT, SPEED)
	<b>USB</b>	1x USB 3.0 port, 9-pin type-A connector
	<b>SERIAL PORT CONTROL</b>	1x 16C550-compatible serial port, RS232 signalling, RJ-45 Reset button and HDD activity LED
<b>ONBOARD INTERFACES</b>	<b>SATA</b>	1x SATA connector for connecting a SATA 2.5" HDD/SSD (SATA 6Gb/s),
	<b>M.2 SATA</b>	1x M.2 Socket for optional SATA Solid State Drive 22 x 80 mm
<b>GENERAL</b>	<b>WEIGHT</b>	CP3005-SA 8HP: 460 g
	<b>MTBF</b>	1,120,458 h acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30 °C
	<b>POWER CONSUMPTION</b>	typ. 0.5 W, without peripheral devices connected
<b>ENVIRONMENTAL</b>	<b>OPERATING TEMPERATURE</b>	0 °C to +60 °C, standard
	<b>STORAGE TEMPERATURE</b>	-40 °C to +85 °C, extended temperature
	<b>CLIMATIC HUMIDITY</b>	-40 °C to +85 °C (without additional components) 93 % RH at 40 °C, non-condensing (acc. to IEC 60068-2-78)

# CP3005-XMC



## TECHNICAL INFORMATION

<b>FRONT INTERFACES 8HP</b>	<b>XMC CONTROL</b>	XMC front panel bezel cutout Reset button and SATA LED
<b>ONBOARD INTERFACES</b>	<b>XMC</b>	1x onboard XMC connector (P15),
	<b>M.2 SATA</b>	1x x8 PCI Express 2.0-compliant interface with up to 5 GT/s 1x M.2 Socket for optional SATA Solid State Drive 22 x 80 mm
<b>GENERAL</b>	<b>WEIGHT</b>	CP3005-SA 8HP: 430 g
	<b>MTBF</b>	2,017,352 h acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30 °C
	<b>POWER CONSUMPTION</b>	Depends on XMC module, typ. 0 W without XMC
<b>ENVIRONMENTAL</b>	<b>OPERATING TEMPERATURE</b>	0 °C to +60 °C, standard -40 °C to +85 °C, extended temperature
	<b>STORAGE TEMPERATURE</b>	-40 °C to +85 °C (without additional components)
	<b>CLIMATIC HUMIDITY</b>	93 % RH at 40 °C, non-condensing (acc. to IEC 60068-2-78)

## ▶ ORDERING INFORMATION

ARTICLE	DESCRIPTION
<b>INITIAL CONFIGURATIONS</b>	
CP3005-SA-2.5Q-8-4F-T	CP3005-SA, 2.5 GHz Quad Core™ i5, 8 GByte, 4HP, Front IO only, TPM
CP3005-SA-2.5Q-8-4F-T-E1X	CP3005-SA, 2.5 GHz Quad Core™ i5, 8 GByte, 4HP, Front IO only, TPM, extended temperature -40 °C/+70 °C
CP3005-SA-2.5Q-8-8F-T	CP3005-SA, 2.5 GHz Quad Core™ i5, 8 GByte, 8HP, Front IO only, CP3005-HDD Mezzanine, TPM
CP3005-SA-2.5Q-8-8R-T	CP3005-SA, 2.5 GHz Quad Core™ i5, 8 GByte, 8HP, with Rear IO, TPM
CP3005-SA-2.7S-32-4R-T	CP3005-SA, 2.7 GHz Six Core™ Xeon® E, 32 GByte, 4HP, with Rear IO, TPM
CP3005-SA-2.7S-32-8XR-T	CP3005-SA, 2.7 GHz Six Core™ Xeon® E, 32 GByte, with Rear IO, 8HP with XMC carrier, TPM
CP3005-SA-2.0S-16-4R-T-E1X	CP3005-SA, 2.0 GHz Six Core™ Xeon® E, 16 GByte, 4HP, with Rear IO, TPM, extended temperature -40 °C/+70 °C
CP3005-SA-1.6Q-8-4F-T-E1X	CP3005-SA, 1.6 GHz Quad Core™ i3, 8 GByte, 4HP, Front IO only, TPM, temperature range -40 °C/+70 °C
<b>MORE CONFIGURATIONS COMING</b>	
Please contact your local sales representative for other configuration options: CPU variant, RAM size, rear I/O support, HDD I/O mezzanine option, XMC mezzanine option, extended temperature option, conformal coating option)	
<b>FLASH STORAGE</b>	
(as separate items, not mounted on the CPU card)	
CP-SSD-M2-2242-XXXGB-E2	M.2 SATA Flash module 22 x 42 mm, various sizes available, extended temperature -40 °C to +85 °C
CP-SSD-M2-2280-XXXGB-E2	M.2 SATA Flash module 22 x 80 mm, various sizes available, extended temperature -40 °C to +85 °C
<b>REAR TRANSITION MODULES</b>	
CP-RI03-04	4HP rear I/O module (2x Ethernet, 2x USB, VGA, 2x SATA connectors)
CP-RI03-08	8HP rear I/O module (additional to 4HP COM1/2)
CP-RI03-04S	4HP rear I/O module (2x Ethernet, COM, VGA, 2x SATA connectors)
<b>SOFTWARE</b>	
VXW-BSP-CP3005-SA-V7.X	VxWorks 7.x Board Support Package
LINUX BSP	Via download from the website
WINDOWS PACKAGES	Via download from the website

## ▶ GLOBAL HEADQUARTERS

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