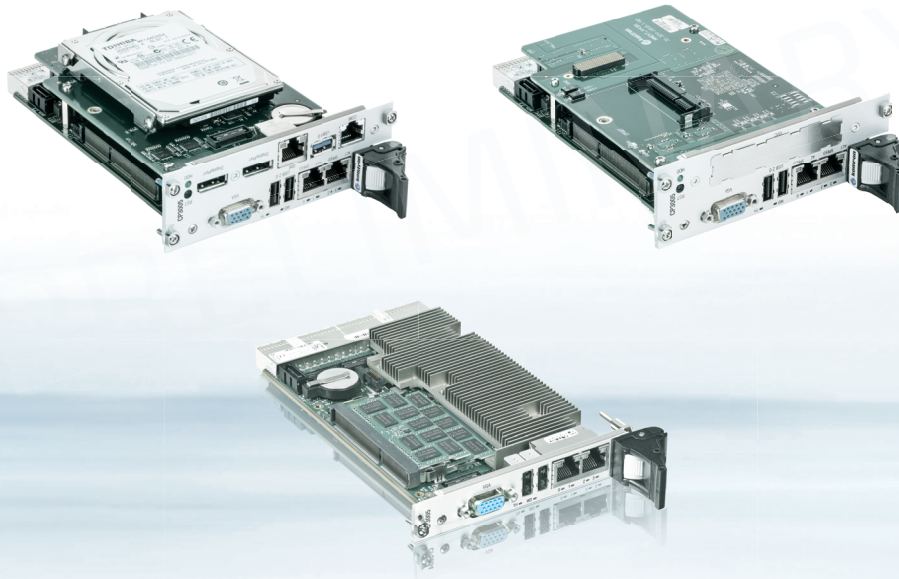# CP3005-SA

3U CompactPCI CPU Board with 8th 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

kontron
S&T Group

CP3005-SA
8th Generation 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, CFast, M.2
Rear I/O, backward compatible

▶ **Robustness**
Temperature option -40 °C up tp +70 °C
Designed for VITA47 EAC3

▶ **Security**
Hardware based encryption / TPM2.0
Kontron APPROTECT based on 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 Gen. Intel® Core™ i5 and i7, Intel's newest refresh of the 14 nanometer technology with up to 6 cores. Combined with Intel® UHD Graphics P630, It provides a new level of graphics performance compared to previous platform designs.

CP3005-SA, when assembled with the 8th Gen. Xeon® E processor, is selected for typical server applications and whenever error-correcting code (ECC) memory is a must.

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

8th Generation Intel® Core™ and 4K video experience
CP3005-SA comes with a 2.5 GHz Intel® Core™ i5-8400H quad core vPro, no ECC, with 8 MByte Cache, and with a 2.7 GHz Intel® Xeon® E-2176M six core vPro with ECC and 12 MByte Cache. Other CPU options will follow. The Intel® UHD Graphics P630 provides three independent graphics outputs and supports DirectX® 12 and OpenGL 4.5. 4K video experience enables UHD streaming and high quality video for applications such as digital signage, and digital security and surveillance.

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 in conjunction with the Xeon processor.
A SATA flash can be used as storage device for onboard data or operating system data. Typically, capacities of 32 GByte are sufficient for this purpose. But 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 and three ports, as well as serial ports, GPIO, and SATA 6Gb/s. Backwards compatibiliy 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 a CFast module. PCI passive mode to run in peripheral slots, opens the door for Multi-CPU systems.

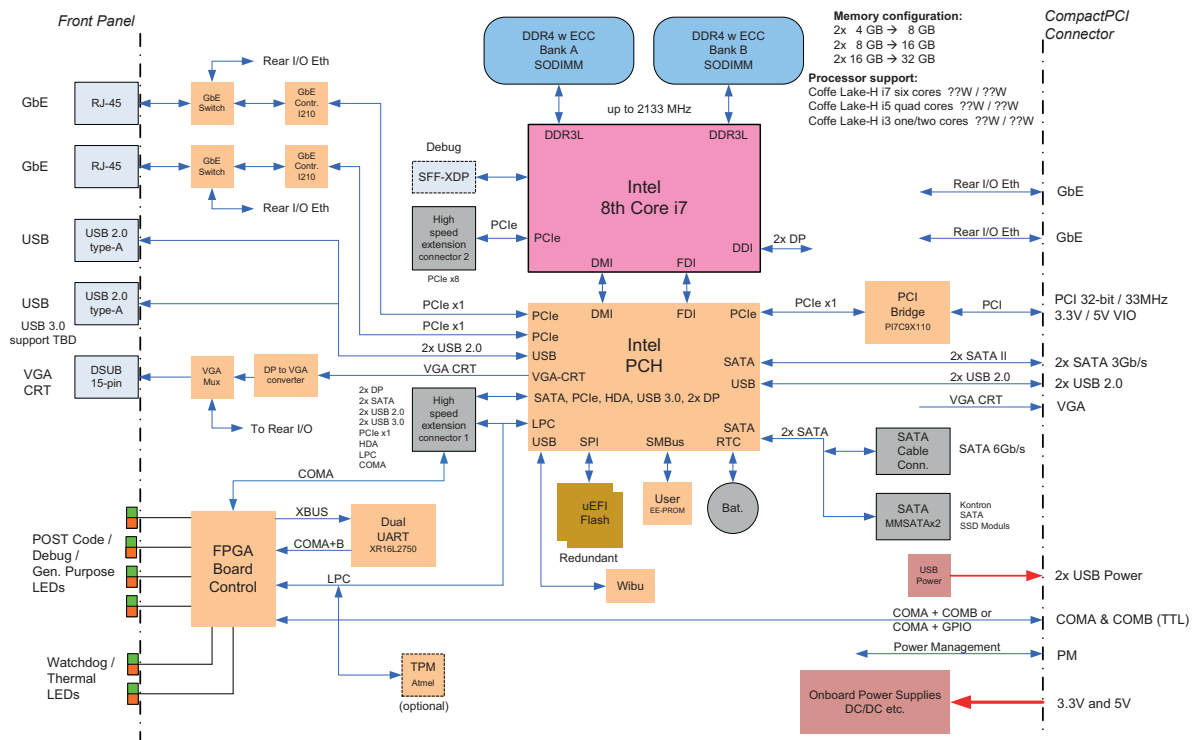### Ready for Kontron APPROTECT/WIBU Security and TPM
CP3005-SA is ready to be used with Kontron APPROTECT, based on Wibu-Systems technology. Kontron APPROTECT is a complementary product and may be purchased separately as an option. The related security chip is soldered onto the PCB which is important for many field deployments. It provides copy protection, IP protection, license model enforcement, license handling, implementation of license models, assignment of privileges or access levels.
In addition, 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.

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.

CP3005: Intel 8th Core i7 (Coffee Lake)
3U cPCI Processor Board

▶ TECHNICAL INFORMATION (PRELMINARY)

PROCESSOR		8th Generation Intel® processor (14nm technology): - Intel® Xeon® E-2176M, 6-Core, 2.7 GHz (base), 4.4 GHz (max), with ECC, 12 MByte Cache - Intel® Core™ i5-8400H, 4-Core, 2.5 GHz (base), 4.2 GHz (max), no ECC, 8 MByte Cache - Others may be following 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	Up to 32 GByte dual channel DDR4 SDRAM at 2400 MT/s, via two SODIMM sockets, ECC support by Intel® Xeon® only
	BOOT FLASH (UEFI)	Two redundant 16 MByte SPI boot flashes with fail-over functionality
	SATA FLASH	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.
	HDD	Onboard 2.5" SATA SSD/HDD installation on 8HP variants via CP3005-HDD extension
	CFAST	Onboard CFast installation via 8HP extension
ONBOARD CONTROLLER	PLATFORM CONTROLLER HUB	Mobile Intel® QM370 Platform Controller Hub (Core branded CPU's) Mobile Intel® CM246 Platform Controller Hub (Xeon branded CPU's) Both featuring: - PCI Express® max. 20 resp. 24 lanes with x1, x2, x4 configurations - USB host interface with 14 ports USB 3.1/2.0 - SATA 6.0 Gb/s max. 4 ports with RAID 0/1/5/10 support
	GRAPHICS	Intel® UHD Graphics P630 integrated - up to 3x independent graphics outputs - Supports DirectX® 12 and OpenGL 4.5 Maximum resolutions - VGA with a CRT monitor: tbd - VGA with a LCD monitor: tbd - DisplayPort: 4096 x 2304 pixels @ 60 Hz
	GIGABIT ETHERNET	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
	UART	dual UART, EXAR XR16L2750
	WATCHDOG	FPGA-based, timeout ranging from 125ms to 4096s programmable in 16 steps, IRQ, reset, dual-stage configuration
	RTC	Integrated in PCH, with 256 Byte CMOS RAM
	TRUSTED PLATFORM MODULE (TPM)	Infineon SLB9670 TPM 2.0 controller
	WIBU	WIBU CodeMeter ASIC 1504-03 for Kontron APPROTECT

▶ TECHNICAL INFORMATION (PRELMINARY)

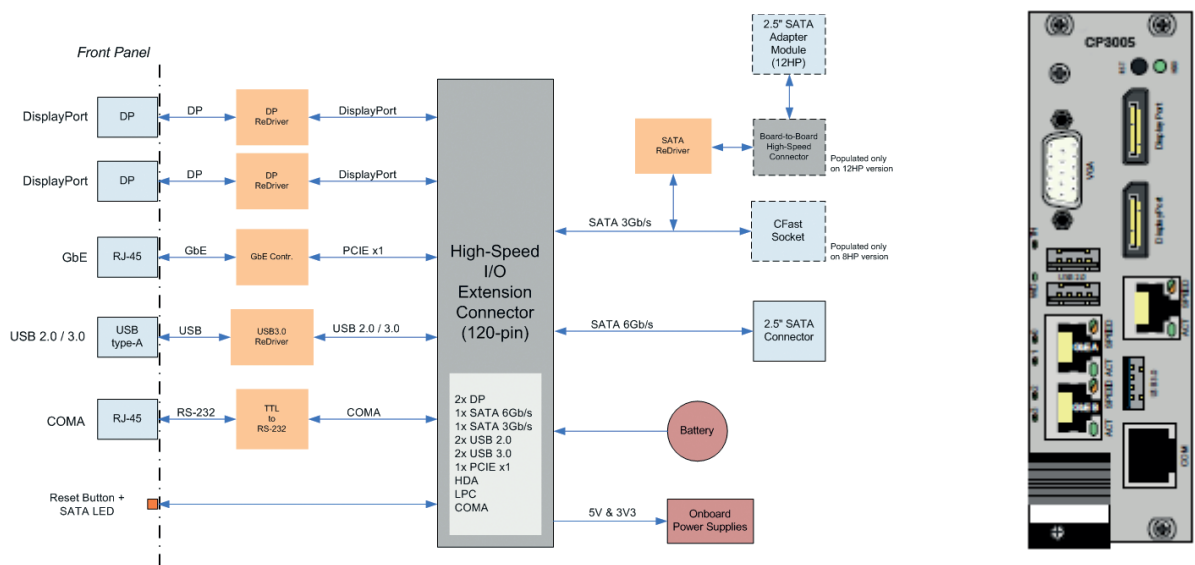|		
FRONT INTERFACES 4HP	VGA USB ETHERNET LED'S	1x VGA-CRT 15-pin D-Sub connector 2x USB 2.0 ports, 4-pin standard USB connectors 2x RJ-45 with integrated LEDs (ACT, SPEED) 6x LEDs: 4x POST Code or General Purpose, WD, TH
ONBOARD INTERFACES	SATA CABLE CONNECTOR SATA EXTENSION CONNECTOR HIGH-SPEED EXTENSION CONNECTORS	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
REAR I/O VIA J2		- 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), 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
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® 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)
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 Class B / EN 55024
GENERAL	DIMENSIONS WEIGHT MTBF	3U 4HP/8HP/12HP CompactPCI, 100 x 160 mm CP3005-SA 4HP: 320 g tbd acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30 °C
POWER CONSUMPTION		CP3005-SA with Xeon® E-2176M: typ. W tbd CP3005-SA with Core™ i5-8400H: typ.W tbd
ENVIRONMENTAL	OPERATING TEMPERATURE STORAGE TEMPERATURE CLIMATIC HUMIDITY	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 CFast card.

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 CFast card.
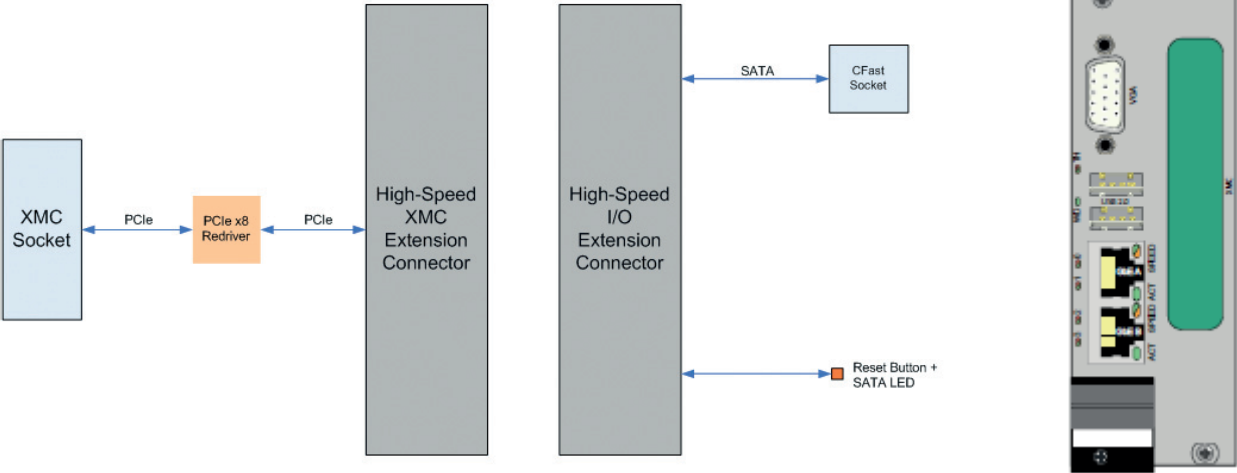
CP3005-HDD

▶ **TECHNICAL INFORMATION**

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

CP3005-XMC

▶ TECHNICAL INFORMATION

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

► ORDERING INFORMATION

ARTICLE	DESCRIPTION
CP3005-SA EVALUATION SAMPLES	Please ask
INITIAL CONFIGURATIONS	
CP3005-SA-2.5Q-8-8F-T	CP3005-SA Quad Core i5, 8 GByte, 8HP, Front IO only, CP3005-HDD Mezzanine, TPM
CP3005-SA-2.5Q-16-4R-T	CP3005-SA Quad Core i5, 16 GByte, 4HP, with Rear IO, TPM
CP3005-SA-2.7S-32-4R-T	CP3005-SA Six Core Xeon E, 32 GByte, 4HP, with Rear IO, TPM
MORE CONFIGURATIONS COMING	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)
FLASH STORAGE	(as separate items, not mounted on the CPU card)
CP-SSD-M2-2242-XXXGB-E2	M.2 SATA Flash module, various sizes available, extended temperature -40 °C to +85 °C
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-RIO3-08	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-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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