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
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 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 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.
**TECHNICAL INFORMATION (PRELIMINARY)**

### 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® CM246 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 support
- SATA 6 Gb/s max. 4 ports with RAID 0/1/5/10 support
- Intel® UHD Graphics P630 integrated
- 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 at 60 Hz

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 extension.

### GRAPHICS
- **GIGABIT ETHERNET**
  - 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 Gb/s max. 4 ports with RAID 0/1/5/10 support
    - Intel® UHD Graphics P630 integrated
    - 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 at 60 Hz

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 extension.

### UART WATCHDOG
- **RTC**
  - TRUSTED PLATFORM MODULE (TPM)
- **WIBU**
  - WIBU CodeMeter ASIC 1504-03 for Kontron APPROTECT
TECHNICAL INFORMATION (PRELIMINARY)

FRONT INTERFACES 4HP

<table>
<thead>
<tr>
<th>VGA</th>
<th>1x VGA-CRT 15-pin D-Sub connector</th>
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</thead>
<tbody>
<tr>
<td>USB</td>
<td>2x USB 2.0 ports, 4-pin standard USB connectors</td>
</tr>
<tr>
<td>ETHERNET</td>
<td>2x RJ-45 with integrated LEDs (ACT, SPEED)</td>
</tr>
<tr>
<td>LED'S</td>
<td>6x LEDs: 4x POST Code or General Purpose, WD, TH</td>
</tr>
</tbody>
</table>

ONBOARD INTERFACES

<table>
<thead>
<tr>
<th>SATA CABLE CONNECTOR</th>
<th>1x onboard standard 7-pin SATA connector with locking mechanism, SATA 6Gb/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA EXTENSION CONNECTOR</td>
<td>M.2 connector holding one SATA port for a M.2 SATA 22x42 Flash module</td>
</tr>
<tr>
<td>HIGH-SPEED EXTENSION</td>
<td>2x high-speed connectors (used for expansion mezzanines of 8HP boards), holding:</td>
</tr>
<tr>
<td>CONNECTORS</td>
<td>- PCI Express®</td>
</tr>
<tr>
<td></td>
<td>- One SATA 3Gb/s</td>
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<tr>
<td></td>
<td>- One SATA 6Gb/s</td>
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<tr>
<td></td>
<td>- 2x USB 2.0/3.0</td>
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<tr>
<td></td>
<td>- 2x DisplayPort</td>
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<td></td>
<td>- CDMI (TTL)</td>
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<td></td>
<td>- HDA</td>
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<td></td>
<td>- LPC</td>
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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 GPIOs 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)

COMPLIANCE

- 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 | 3U 6HP/BHP/12HP CompactPCI, 100 x 160 mm |
| WEIGHT | CP3005-SA 4HP: 320 g |
| MTBF | 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 | 0 °C to +60 °C, standard |
| STORAGE TEMPERATURE | -40 °C to +70 °C, extended temp. |
| CLIMATIC HUMIDITY | -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 BHP 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.
Front Panel

DisplayPort

1x DisplayPort connector, 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 activity LED

Onboard Interfaces

SATA

1x SATA connector for connecting a SATA 2.5" HDD/SSD (SATA 6Gb/s), 1x CFast card socket

CFast

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

-40 °C to +85 °C (without additional components)

Storage Temperature

-40 °C to +85 °C

Industrial PC:

-40 °C to +85 °C (without additional components)

Climatic Humidity

93 % RH at 40 °C, non-condensing (acc. to IEC 60068-2-78)
TECHNICAL INFORMATION

FRONT INTERFACES BHP

| XMC CONTROL          | XMC front panel bezel cutout
|                      | Reset button and CFast activity LED

ONBOARD INTERFACES

| XMC                  | 1x onboard XMC connector (P15),
|                      | 1x x8 PCI Express 2.0-compliant interface with up to 5 GT/s
| CFAST               | 1x CFast card socket

GENERAL

| WEIGHT               | CP3005-SA 8HP: 430 g
| MTBF                 | 2,017,352 h acc. to MIL-HDBK-217 FN2, Ground Benign, controlled at 30 °C
| POWER CONSUMPTION    | Depends on XMC module, typ. 0 W without XMC

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)
## ORDERING INFORMATION

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP3005-SA</td>
<td>Please ask</td>
</tr>
</tbody>
</table>

### INITIAL CONFIGURATIONS

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP3005-SA-2.5Q-8-8F-T</td>
<td>CP3005-SA Quad Core i5, 8 GByte, 8HP, Front IO only, CP3005-HDD Mezzanine, TPM</td>
</tr>
<tr>
<td>CP3005-SA-2.5Q-16-4R-T</td>
<td>CP3005-SA Quad Core i5, 16 GByte, 4HP, with Rear IO, TPM</td>
</tr>
<tr>
<td>CP3005-SA-2.7S-32-4R-T</td>
<td>CP3005-SA Six Core Xeon E, 32 GByte, 4HP, with Rear IO, TPM</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-SSD-M2-2242-XXXGB-E2</td>
<td>M.2 SATA Flash module, various sizes available, extended temperature -40 °C to +85 °C</td>
</tr>
<tr>
<td>CPFASTX</td>
<td>Industrial grade CFast, various sizes available</td>
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</tbody>
</table>

### REAR TRANSITION MODULES

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-RIO3-04</td>
<td>4HP rear I/O module (2x Ethernet, 2x USB, VGA, 2x SATA connectors)</td>
</tr>
<tr>
<td>CP-RIO3-08</td>
<td>8HP rear I/O module (additional to 4HP COM1/2)</td>
</tr>
<tr>
<td>CP-RIO3-04S</td>
<td>4HP rear I/O module (2x Ethernet, COM, VGA, 2x SATA connectors)</td>
</tr>
</tbody>
</table>

### SOFTWARE

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VXW-BSP-CP3005-SA-V7.X</td>
<td>VxWorks 7.x Board Support Package</td>
</tr>
<tr>
<td>LINUX BSP</td>
<td>Via download from the website</td>
</tr>
<tr>
<td>WINDOWS PACKAGES</td>
<td>Via download from the website</td>
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**GLOBAL HEADQUARTERS**

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