Product Information

PC4-PRESTO • CompactPCI® PlusIO CPU Card

4th Generation Intel® Core™ Processor

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The PC4-PRESTO is a rich featured high performance 4HP/3U CompactPCI® PlusIO CPU board, equipped with a 4th Generation Intel® Core™ mobile processor (Haswell dual- or quad-core). The PC4-PRESTO front panel is provided with two Gigabit Ethernet jacks, two USB 3.0 receptacles, and two Mini DisplayPort connectors, compliant with the DisplayPort 1.2 standard for Multi-Stream-Transport (MST).

Local expansion mezzanine boards (side cards) are available for additional front panel and/or rear I/O, resulting in an 8HP front panel width assembly unit.

The PC4-PRESTO is equipped with up to 16GB RAM with ECC support. 8GB memory-down are provided for rugged applications, and another 8GB are available via the DDR3 ECC SO-DIMM socket. Low profile SSD mezzanine modules are available as on-board mass storage solution, maintaining the 4HP front panel width.

The PC4-PRESTO backplane connectors comply with the PICMG® CompactPCI® PlusIO system slot specification, via J2 suitable for a rear I/O module or hybrid CompactPCI® Serial system. The PC4-PRESTO is backwards compatible to classic CompactPCI® systems.
## Feature Summary

### General
- CompactPCI® PlusIO (PICMG® CPCI 2.30) System Slot Controller
- Form factor single size Eurocard (board dimensions 100x160mm²)
- Mounting height 3U
- Front panel width 4HP (8HP/12HP assembly with optional mezzanine side card)
- Front panel I/O connectors for typical system configuration (2 x USB3, 2 x DisplayPort, 2 x GbE)
- Backplane communication via CompactPCI® J1 and J2 hard metric connectors
- J1 Connector for PICMG® CompactPCI® 32-Bit support
- J2 Connector (UHM high speed) for CompactPCI® PlusIO support (4 x PCIe Gen2, 4 x SATA 3G/6G*, 4 x USB, 2 x GbE)
- J2 PlusIO configuration allows for either CompactPCI® Serial backplane usage or rear I/O module attachment
- On-board PCIe x 4 Gen2 mezzanine expansion option (side card)
- On-board SATA x 4 6G mezzanine expansion option for mass storage modules or side cards
- On-board DisplayPort (3rd video output) mezzanine expansion option for side cards
- Side cards and low profile mass storage modules available as COTS and also as custom specific

### Processor
- 4th Generation Intel® Core™ CPU (Haswell)
  - i7-4700EQ Processor 2.4/1.7GHz (TB 3.4GHz) • 47W/37W TDP • Quad-Core • GT2-4600 Graphics 1000MHz • vPRO™/AMT
  - i5-4400E Processor 2.7GHz (TB 3.3GHz) • 37W TDP • Dual-Core • GT2-4600 Graphics 1000MHz • vPRO™/AMT
  - i5-4410E Processor 2.9GHz • 37W TDP • Dual-Core • GT2-4600 Graphics 1000MHz • vPRO™/AMT
  - i5-4422E Processor 1.8GHz (TB 2.9GHz) • 25W TDP • Dual-Core • GT2-4600 Graphics 900MHz • vPRO™/AMT
  - i3-4110E Processor 2.6GHz • 37W TDP • Dual-Core • GT2-4600 Graphics 900MHz
  - i3-4112E Processor 1.8GHz • 25W TDP • Dual-Core • GT2-4600 Graphics 900MHz
  - Celeron 2000E Processor 2.2GHz • 37W TDP • Dual-Core • HD Graphics 900MHz
  - Celeron 2002E Processor 1.5GHz • 25W TDP • Dual-Core • HD Graphics 900MHz

### Firmware
- Phoenix® UEFI (Unified Extensible Firmware Interface) with CSM*
- Fully customizable by EKF
- Secure Boot and Measured Boot supported - meeting all demands as specified by Microsoft®
- Windows®, Linux and other (RTOS) supported
- Intel® AMT supported for i7 and i5 processors (disabled by default, must be enabled via BIOS setup)

*CSM (Compatibility Support Module) emulates a legacy BIOS environment, which allows to boot a legacy operating system such as DOS, 32-bit Windows and some RTOS*
## Feature Summary

### Main Memory
- Integrated memory controller up to 16GB DDR3L 1600 +ECC
- DDR3L +ECC soldered memory up to 8GB
- DDR3L +ECC SO-DIMM memory module socket up to 8GB

### Graphics
- Integrated HD Graphics Engine, 3 symmetric independent displays
- Enhanced Media Processing, DX11.1, OpenCL 1.2, OpenGL 4.3, JPEG, MJPEG, MVC, SVC, MPEG-2
- Front panel: Dual Mini-DisplayPort (mDP) or single VGA connector option
- 3rd DisplayPort connector via mezzanine side card
- DisplayPort™ 1.2 Multi-Stream Transport (MST) - display daisy chaining
- Max Resolution 3200 x 2000 @60Hz (any DisplayPort), 1920 x 1200 (VGA)
- 4k x 2k @24Hz supported for Blu-ray playback
- Integrated audio

### Networking
- Up to 4 networking interfaces in total - 2 x front RJ45 GbE, 2 x backplane GbE via J2
- 1000BASE-T, 100BASE-TX, 10BASE-T connections
- Front port 1 - I217LM with Intel® AMT support
- Front port 2 - Intel® I210-IT -40°C to +85°C operating temperature GbE NIC w. integrated PHY
- Front port option M12 X-coded connectors (replacement for RJ45, requires 8HP front panel width)
- IPv4/IPv6 checksum offload, 9.5KB Jumbo Frame support, EEE Energy Efficient Ethernet
- IEEE 802.1Qav Audio-Video-Bridging (AVB) enhancements for time-sensitive streams
- IEEE 1588 and 802.1AS packets hardware-based time stamping for high-precision time synchronization
- Backplane Gigabit Ethernet w. 2 x I210-IT NIC

### Chipset
- Intel® QM87 Lynx Point Platform Controller Hub (PCH)
- 8 x PCIe Gen2 5GT/s
- 6 x SATA 6G
- 10 x USB2, 4 x USB3
- LPC, Audio, Legacy
## Feature Summary

### On-Board Building Blocks
- Additional on-board controllers, PCIe® based
- 3 x Gigabit Ethernet controllers Intel® I210IT
- 1 x Gigabit Ethernet PHY Intel® I217LM
- PCIe® to PCI® Bridge PLX 8112
- PCIe® Gen2 packet switch PLX 8608
- SATA 3G/6G* RAID controller Marvell® 88SE9230, ARM powered subsystem for host CPU offload

* Marvell SATA RAID controller setup for 3Gbps by default - please refer to the PC4-PRESTO User Guide

### Security
- Trusted Platform Module
- TPM 2.0 for highest level of certified platform protection
- Infineon Optiga™ SLB 9665 cryptographic processor
- Conforming to TCG 2.0 specification
- AES hardware acceleration support by 4th Gen processor 4xxx series (Intel® AES-NI)

### Front Panel I/O (4HP)
- 2 x Gigabit Ethernet RJ45 (1 = PCH & I217LM - iAMT, 2 = I210IT)
- 2 x DisplayPort (from processor integrated HD graphics engine, mDP style receptacles, optional cable connector retainer available)
- 2 x USB 3.0

### CompactPCI® & CompactPCI® PlusIO Backplane Resources
- PICMG® CompactPCI® 2.0 CPU card & system slot controller for J1 based 32-bit PCI® systems, 33/66MHz
- PICMG® CompactPCI® 2.30 J2 UHM connector according to CompactPCI® PlusIO
- J2 can be used to enable CompactPCI® Serial peripheral card slots for hybrid systems with a split backplane
- J2 can be used alternatively for a rear I/O module
- J2 is assigned to 4 x PCIe Gen2 5GT/s (from PCH), 4 x SATA 3G/6G* (from Marvell SATA hardware RAID controller), 4 x USB2 ports (from PCH), 2 x Gigabit Ethernet (I210IT networking controllers)

* Marvell SATA RAID controller setup for 3Gbps by default - please refer to the PC4-PRESTO User Guide
### Feature Summary

#### Local Expansion and Mass Storage Solutions

- Mezzanine side card connectors for optional local expansion
- **P-EXP** - 2 x USB 2.0 & Legacy (from PCH)
- **P-DP3** - 3rd DisplayPort video (from Intel® Core™ CPU)
- **P-HSE** - 4 x SATA 6G & 4 x USB 2.0 (from PCH)
- **P-PCIE** - PCIe Gen2 5GT/s 1 link x 4 lanes or 4 links x 1 lane (from on-board PCIe® switch)
- 4HP Low profile mezzanine module options (to be ordered separately)
- CFast™ Card with C41-CFAST mezzanine module
- SATA 1.8-Inch Solid State Drive with C42-SATA mezzanine module
- Dual mSATA SSD with C47-MSATA mezzanine module
- Dual M.2/NGFF SATA SSD 2230 - 2280 size with C48-M2 mezzanine module
- Custom specific module design
- 8HP/12HP Mezzanine side card options (to be ordered separately)
  - **PCL-CAPELLA** - multi function side card
  - **PCS-BALLET** - multi function side card
  - **SCS-TRUMPET** - multi function side card
  - **C32-FIO** - 2 x COM RS-232, USB, PS/2 (12HP assembly)
  - Variety of other side cards available
  - Custom specific side card design

#### Environmental & Regulatory

- Suitable e.g. for industrial, transportation & instrumentation applications
- Designed & manufactured in Germany - ISO 9000 quality management certified
- Long term availability
- Rugged solution
- Coating, sealing, underfilling on request
- Lifetime application support
- RoHS compliant
- Operating temperature 0°C to +70°C
- Operating temperature -40°C to +85°C (industrial temperature range) on request
- Storage temperature -40°C to +85°C, max. gradient 5°C/min
- Humidity 5% ... 95% RH non condensing
- Altitude -300m ... +3000m
- Shock 15g 0.33ms, 6g 6ms
- Vibration 1g 5-2000Hz
- MTBF 11.0 years (PC4-480D)
- EC Regulatory EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)
Feature Summary

**RT OS Board Support Packages & Driver**

- LynxOS - on request
- On Time RTOS-32 - on request
- OS-9 - on request
- QNX 4.x, 6.x - on request
- Real-Time Linux (RT Patch) - on request
- RTX - on request
- VxWorks 5.5 & 6.9 - on request
- VxWorks 7.0 - under development
- Others - on request

All items are subject to change w/o further notice

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<td>For popular Mezzanine Side Cards please refer to <a href="http://www.ekf.com/liste/liste_20.html#C40">www.ekf.com/liste/liste_20.html#C40</a></td>
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CompactPCI® PlusIO (PICMG® 2.30) is an enhancement for rear I/O across J2. High speed signal lines (PCI Express®, SATA, Gigabit Ethernet and USB) are passed from the PC4-PRESTO through the special UHM J2 connector to the backplane, for usage either with a PlusIO rear I/O transition module, or CompactPCI® Serial card slots.

CompactPCI® Serial (PICMG® CPCIS.0) defines a completely new card slot, based on PCI Express®, SATA, Gigabit Ethernet and USB serial data lines. On a hybrid backplane, both card styles can reside, CompactPCI® and CompactPCI® Serial, with the PC4-PRESTO in the middle as controller for both backplane segments.

**Related Documents CompactPCI® Serial & CompactPCI® PlusIO**

| CompactPCI® PlusIO Home             | www.ekf.com/p/plus.html          |
| CompactPCI® Serial Home             | www.ekf.com/s/serial.html        |

**Related Documents Mezzanine Modules and Side Cards**

| C40 ... C48 Series Mezzanine Storage Modules | www.ekf.com/c/ccpu/c4x_mezz_ovw.pdf |
| PCS-BALLET Mezzanine Side Card              | www.ekf.com/p/pcs/pcs.html         |
| SCS-TRUMPET Mezzanine Side Card             | www.ekf.com/s/scs/scs.html         |
CompactPCI® PlusIO Racks Available

Hybrid Backplanes Available
Small System w. Hybrid Backplane

Small System w. CompactPCI® Serial Backplane
The PC4-PRESTO is equipped with a set of local expansion interface connectors, which can be optionally used to attach a mezzanine side board. A variety of expansion cards is available, e.g. providing legacy I/O and additional PCI Express® based I/O controllers such as SATA, USB 3.0 and Gigabit Ethernet, or a third video output. Most mezzanine side cards can accommodate in addition a 2.5-inch drive.

Typically, the PC4-PRESTO and the related side card would come as a readily assembled 8HP unit. As an alternate, low profile Flash based mezzanine storage modules are available that fit on the PC4-PRESTO while maintaining the 4HP profile. The C48-M2 module e.g. is equipped with two M.2 (up to 2280 size) SATA Solid State Drives (SSD), suitable for installation of any popular operating system.
PC4-PRESTO w. C47-MSATA Dual-SSD Mezzanine Storage Module

Expansion Interface for Low Profile SSD Mezzanine
Expansion Interface Connectors for 8HP Mezzanine Assembly

PC4-PRESTO w. SCS-TRUMPET Side Card 8HP Assembly (2.5-Inch SSD)
PC4-PRESTO w. SCS-TRUMPET Side Card 8HP Assembly (Dual M.2 SSD)
PC4-PRESTO w. PCS-BALLET Side Card 8HP Assembly (2.5-Inch SSD)

PC4-PRESTO w. PCS-BALLET Side Card 8HP Assembly (Dual mSATA SSD)
Front Panel Options

PC4-PRESTO • CompactPCI® PlusIO • 4th Generation Intel® Core™-4xxx Processor

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Screw Locking for mDP Connectors

The front panel is provided with a threaded hole for fixing a H-shape retainer plate, which is available from EKF as accessory (image above).

As an alternate, the customer can use cable assemblies with screw-locked mDP connectors (image below). The front panel has to be modified however for this solution (two threaded holes in addition, please specify when ordering).
PC4-PRESTO w. PCS-BALLET Side Card 8HP Assembly (CFAST SSD)

PC4-PRESTO w. PCS-BALLET Side Card 8HP Assembly (Slim SATA SSD)
PC4-PRESTO w. PCL-CAPELLA Side Card 8HP Assembly

PC4-PRESTO w. PCL-CAPELLA Side Card 8HP Assembly
Beyond All Limits:
EKF High Performance Embedded