



Product Information

PC7-FESTIVAL • CompactPCI® PlusIO CPU Card

Intel® Mobile Workstation Processor
7th Generation XEON® E3 v6 Family

Preliminary Edition



General

The PC7-FESTIVAL is a rich featured high performance 4HP/3U CompactPCI® PlusIO CPU board, equipped with an Intel® Xeon® E3 family mobile workstation processor for demanding applications. For scalability, the PC7-FESTIVAL is also available with a 7th Generation Intel® Core™ processor.

The PC7-FESTIVAL front panel is provided with two RJ45 Gigabit Ethernet jacks, two USB 3.0 Type-A receptacles, and two DisplayPort connectors. In addition, up to two USB Type-C front panel receptacles are available as an option, one of them usable alternatively as (third) DisplayPort.

The powerful Xeon® E3-1500 v6 series processor is accompanied by the CM238 mobile PCH, for a maximum of high speed I/O resources (e.g. PCI Express®, SATA, USB).

On-board mass-storage solutions are based on low profile mezzanine expansion cards, which can accommodate up to two M.2 style SSD modules (PCIe® Gen3 x4 and/or SATA). Side cards for an 8HP assembly are also available, providing front I/O and M.2 SSDs.

The PC7-FESTIVAL is equipped with up to 32GB DDR4 RAM with ECC support. Up to 16GB memory-down are provided for rugged applications, and another 16GB are available via the DDR4 ECC SO-DIMM socket.

The backplane connector J1 allows for up to seven CompactPCI® Classic peripheral cards in a system. The J2 connector complies with the CompactPCI® PlusIO standard for high speed rear I/O (fourfold PCIe®, SATA and USB2), or usage of a hybrid CompactPCI® Serial backplane.

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® Classic 32-Bit support
- ▶ J2 Connector (UHM high speed) for CompactPCI® PlusIO support (PCIe®, SATA, USB2) *
- ▶ J2 PlusIO configuration allows for either CompactPCI® Serial hybrid backplane usage or rear I/O module attachment
- ▶ J2 Connector option available for 64-bit system slot (legacy CompactPCI® 2.0 Classic)
- ▶ Side cards and low profile mass storage modules available as COTS and also as custom specific

* In case of obsolescence, the J2 UHM connector will be replaced by the CompactPCI® 2.0 classic J2 connector. This may reduce high speed backplane transfer in particular applications (PCIe Gen1 2.5GT/s, SATA 1.5G). This does not affect peripherals attached via the P-HSE mezzanine connector.

Power Supply

- ▶ +5V, +3.3V according to CompactPCI® 2.0 via J1 backplane connector
- ▶ Total power consumption depends on processor type and mezzanine assembly
- ▶ Option +5V only board design for low cost system power supply with 25W processors
- ▶ SAC (Stand-Alone Computer) option w. two-pos. 5V/10A terminal block (J1/J2 removed)
- ▶ +12V is required additionally for PC7-FESTIVAL mezzanine assemblies with S20, S40, SCL, SCZ

Processor

- ▶ Intel® Kaby Lake-H mobile platform with ECC (CM238 mobile workstation PCH)
- ▶ Intel® Xeon® processor E3 v6 family (mobile workstation)
 - ▶ Xeon E3 1505M v6 ■ 3/4GHz ■ 8M ■ 4C/8T ■ DDR4 2400 ECC ■ 45/35W ■ GT2 - P630 ■ vPRO™/AMT
 - ▶ Xeon E3 1505L v6 ■ 2.2/3GHz ■ 8M ■ 4C/8T ■ DDR4 2400 ECC ■ 25W ■ GT2 - P630 ■ vPRO™/AMT
 - ▶ Xeon E3 1501M v6 ■ 2.9/3.6GHz ■ 6M ■ 4C/8T ■ DDR4 2400 ECC ■ 45/35W ■ GT2 - P630 ■ vPRO™/AMT
 - ▶ Xeon E3 1501L v6 ■ 2.1/2.9GHz ■ 6M ■ 4C/8T ■ DDR4 2400 ECC ■ 25W ■ GT2 - P630 ■ vPRO™/AMT
- ▶ 7th Generation Intel® Core™ mobile processor
 - ▶ i3 7100E ■ 2.9GHz ■ 3M ■ 2C/4T ■ DDR4 2400 ECC ■ 35W ■ GT2 - 630
 - ▶ i3 7102E ■ 2.1GHz ■ 3M ■ 2C/4T ■ DDR4 2400 ECC ■ 25W ■ GT2 -630

Feature Summary

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 (RT)OS' supported
- ▶ Intel® AMT supported for Intel® Xeon® E3 v6 (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'

Main Memory

- ▶ Integrated memory controller up to 32GB DDR4 2400 +ECC
- ▶ DDR4 +ECC soldered memory up to 16GB
- ▶ DDR4 +ECC SO-DIMM memory module socket up to 16GB

Mezzanine Mass Storage

- ▶ Mezzanine side card connectors for local expansion e.g. SSD mass storage
- ▶ Low profile mezzanine modules available (4HP common front panel)
- ▶ Side cards available (8HP common F/P assembly)
- ▶ P-HSE1 - configurable as 4 x SATA 6G or 4 x PCIe® Gen3 (from CM238 PCH), 1 x USB3
- ▶ P-HSE2 - 4 x PCIe® Gen3 (from CM238 PCH) & 3rd DisplayPort (from CPU)
- ▶ P-EXP - Legacy interface (from PCH)

- ▶ 4HP Low profile mezzanine module preferred options:
 - ▶ C48-M2 Mezzanine module - 2 x M.2 2280 SATA SSD sockets
 - ▶ S20-NVME Mezzanine module - 1 x M.2 2280 NVME SSD socket, 1 x Type-C USB F/P connector
 - ▶ S40-NVME Mezzanine module - 1 x M.2 2280 NVME SSD socket, 1 x M.2 2280 SATA SSD socket, 2 x Type-C USB F/P Connector (1 connector enabled for DisplayPort alternate mode)

- ▶ 8HP/12HP Mezzanine side card options:
 - ▶ SCL-RHYTHM Dual M.2 (NVMe/SATA) SSD, quad port front panel M12-X GbE
 - ▶ SCZ-NVM Dual M.2 NVMe SSD, quad UART
 - ▶ P01-M12 Replacement for RJ45 GbE jacks by M12-X receptacles
 - ▶ PCU-UPTEMPO Side board w. 2 x M.2 SATA SSD sockets & front I/O

- ▶ Custom specific mezzanine side card design - I/O and storage

Feature Summary

Graphics

- ▶ Integrated graphics engine, 3 symmetric independent displays
- ▶ 3D HW acceleration DirectX12, OpenCL 2.x, OpenGL 4.3/4.4, ES 2.0
- ▶ HW video decode/encode HEVC10b 10-bit, VP9 10-bit, JPEG
- ▶ HDR (High Dynamic Range) Rec. 2020 Wide Color Gamut
- ▶ Content protection
- ▶ UHD premium content playback
- ▶ Front panel options: Dual DisplayPort (DP) connectors
- ▶ 3rd DisplayPort optional via Type-C connector on low profile mezzanine card
- ▶ Max resolution 4096 x 2304 @60Hz (any DisplayPort, concurrent operation)
- ▶ DisplayPort™ 1.2 Multi-Stream Transport (MST) - display daisy chaining
- ▶ MST max resolution via single DP connector 2880x1800@60Hz (2 displays), 2304x1440@60Hz (3 displays)
- ▶ Integrated audio (3 independent audio streams)

Networking

- ▶ Two networking interface controllers (NIC), 1000BASE-T, 100BASE-TX, 10BASE-T connections
- ▶ Port 1 equipped w. I219LM PHY (suitable for Intel® AMT)
- ▶ Port 2 equipped w. Intel® I210-IT -40°C to +85°C operating temperature GbE controller
- ▶ 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
- ▶ RJ45 front panel jacks (option 2 x M12-X with mezzanine module P01)
- ▶ Option front panel M12 X-coded GbE ports with SCL-RHYTHM side card (8HP front panel width)

Chipset

- ▶ Intel® CM238 Mobile Workstation Platform Controller Hub (PCH)
- ▶ PCIe® Gen3 8GT/s
- ▶ SATA 6G
- ▶ USB3
- ▶ GbE
- ▶ SPI, LPC, Audio, Legacy

Feature Summary

On-Board Building Blocks

- ▶ Additional on-board devices, PCIe® based
- ▶ PCIe® to PCI® Bridge 32bit 33/66MHz for 7 CompactPCI®Classic peripheral card backplane slots
- ▶ 1 x Gigabit Ethernet controller Intel® I210IT (front I/O)
- ▶ 1 x Gigabit Ethernet PHY Intel® I219LM (front I/O)
- ▶ IEEE 1588-2008 Precision Time Protocol including PPS and PPM signals supported

Security

- ▶ Trusted Platform Module
- ▶ Discrete TPM 2.0 for highest level of certified platform protection
- ▶ Infineon Optiga™ SLM 9670 cryptographic processor
- ▶ Conforming to TCG 2.0 specification
- ▶ Option fTPM (firmware-based TPM 2.0) or dTPM (discrete TPM) selectable from UEFI (BIOS) setup
- ▶ AES hardware acceleration support (Intel® AES-NI)

Front Panel I/O (4HP)

- ▶ 2 x Gigabit Ethernet RJ45 (1 = PCH & I219LM - Intel® AMT support, 2 = I210IT)
- ▶ 2 x DisplayPort (from processor integrated HD graphics engine, standard DP latching receptacles)
- ▶ 2 x USB 3.0 Type-A
- ▶ Option 2 x Type-C USB 3.1 Gen1 w. S40-NVME low profile mezzanine module
- ▶ Support for Type-C locking plugs (dual screw) according to the 'Locking Connector Spec. Rev. 1.0'
- ▶ DisplayPort Alt Mode on lower Type-C connector (3rd video monitor output)

Additional Front I/O (8HP)

- ▶ Option RS-232, USB3, DisplayPort w. SCZ-NVM side card
- ▶ Option quad port GbE M12-X receptacles w. SCL-RHYTHM side card
- ▶ Option 2 x M12-X receptacles for Gigabit Ethernet (P01, as replacement for RJ45)
- ▶ Option RS-232, HD-Audio, USB w. PCU-UPTEMPO side card
- ▶ Custom specific front panel and side card design

Feature Summary

CompactPCI® Backplane Resources

- ▶ PICMG® CompactPCI® 2.0 CPU card & system slot controller for J1 based 32-bit CompactPCI® systems
- ▶ Support for up to seven CompactPCI® peripheral boards, 33/66MHz (PI7C9X112 PCIe® to PCI® bridge)
- ▶ PICMG® CompactPCI® 2.30 J2 UHM connector according to CompactPCI® PlusIO**
- ▶ J2 is assigned to 4 x PCIe® Gen3 8GT/s*, 4 x SATA 6G*, and 4 x USB2 ports (all derived from PCH)
- ▶ J2 can be used to enable CompactPCI® Serial peripheral card slots for hybrid systems with a split backplane
- ▶ Hybrid small system racks available (e.g. SRP-BLUBOXX)
- ▶ J2 can be used alternatively for a rear I/O module
- ▶ Custom specific rear I/O module design on request
- ▶ J2 Connector option available - 64-bit system slot tolerant for legacy CompactPCI® 2.0 (Classic)

** CompactPCI® PlusIO specifies PCIe® 5GT/s and SATA 3G over J2. PCIe® Gen3 and SATA 6G may be functional but cannot be guaranteed.*

*** In case of obsolescence, the J2 UHM connector will be replaced by the CompactPCI® 2.0 classic J2 connector. This may reduce high speed backplane transfer in particular applications (PCIe® Gen1 2.5GT/s, SATA 1.5G). This does not affect peripherals attached via the P-HSE mezzanine connector.*

Environmental & Regulatory

- ▶ Designed & manufactured in Germany
- ▶ ISO 9001 certified quality management
- ▶ 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 11.9 years
- ▶ EC Regulatory EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)

Feature Summary

Applications

- ▶ General industrial computing, for x86 based software
- ▶ IIoT applications, edge computing, IIoT
- ▶ Medium to high embedded CPU performance
- ▶ CompactPCI® Classic and/or CompactPCI® Serial peripheral card expansion
- ▶ Stand-Alone Computer (SAC)

all items are subject to changes



Related Information

PC7-FESTIVAL Home	www.ekf.com/p/pc7/pc7.html
SC5-FESTIVAL User Guide (applies largely also to PC7-FESTIVAL)	www.ekf.com/s/sc5/sc5_ug.pdf

Related Documents CompactPCI® Serial & CompactPCI® PlusIO

CompactPCI® PlusIO Overview	www.ekf.com/p/plusio.pdf
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

C48-M2 Low Profile Mezzanine Storage Module	www.ekf.com/c/ccpu/c48/c48.html
PCU-UPTEMPO Side Board	www.ekf.com/p/pcu/pcu.html
S20-NVME Low Profile Mezzanine Storage & I/O Module	www.ekf.com/s/s20/s20.html
S40-NVME Low Profile Mezzanine Storage & I/O Module	www.ekf.com/s/s40/s40.html
SCL-RHYTHM Side Board	www.ekf.com/s/scl/scl.html
SCZ-NVM Side Board	www.ekf.com/s/scz/scz.html

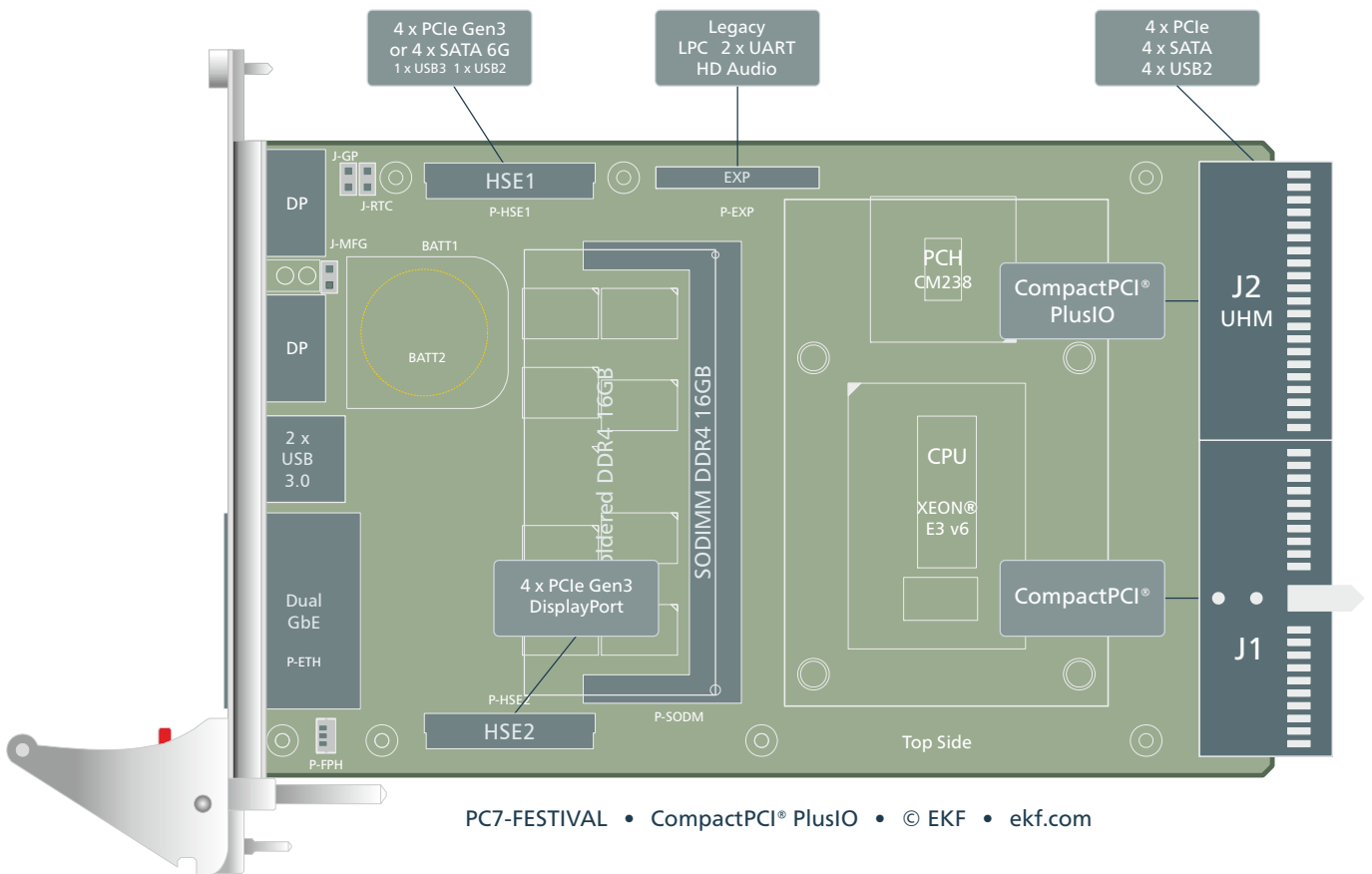
Ordering Information

For popular PC7-FESTIVAL SKUs please refer to www.ekf.com/liste/liste_21.html#PC7

CompactPCI® PlusIO

CompactPCI® PlusIO (PICMG® 2.30) is an enhancement to CompactPCI® Classic which enables system expansion and rear I/O across J2. High speed signal lines (PCI Express®, SATA and USB) are passed from the PC7-FESTIVAL via the J2 connector to the backplane, for usage either with a PlusIO rear I/O transition module, or recent CompactPCI® Serial cards.

CompactPCI® Serial (PICMG® CPCIS.0) defines a card slot based on PCI Express®, SATA, Gigabit Ethernet and USB serial data lines. On a hybrid backplane, both card styles CompactPCI® and CompactPCI® Serial can reside, with the PC7-FESTIVAL in the middle as controller for both backplane segments, combining the technologies of both worlds.



PC7-FESTIVAL • System Expansion Options

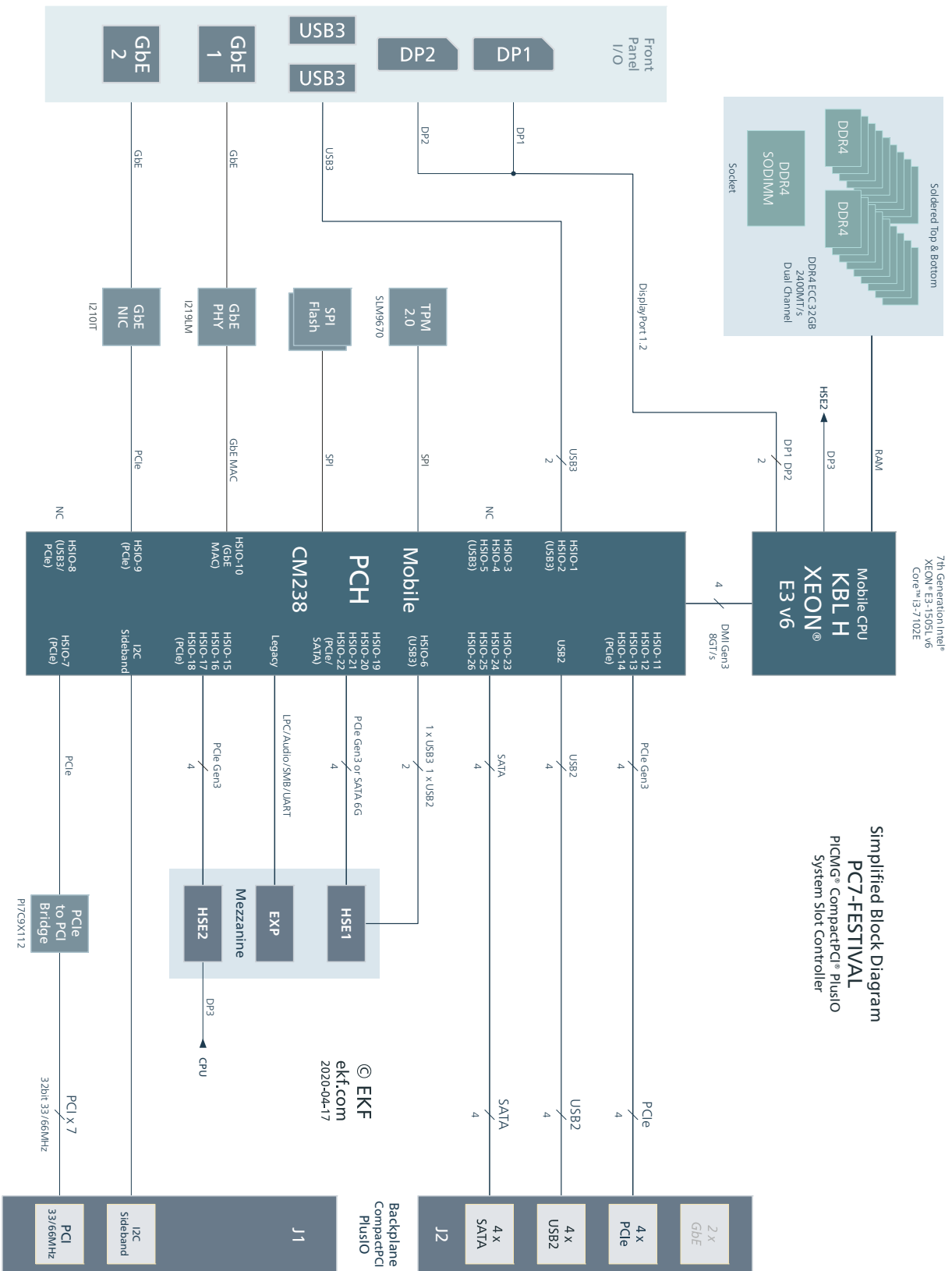


Sample CompactPCI® PlusIO Rack

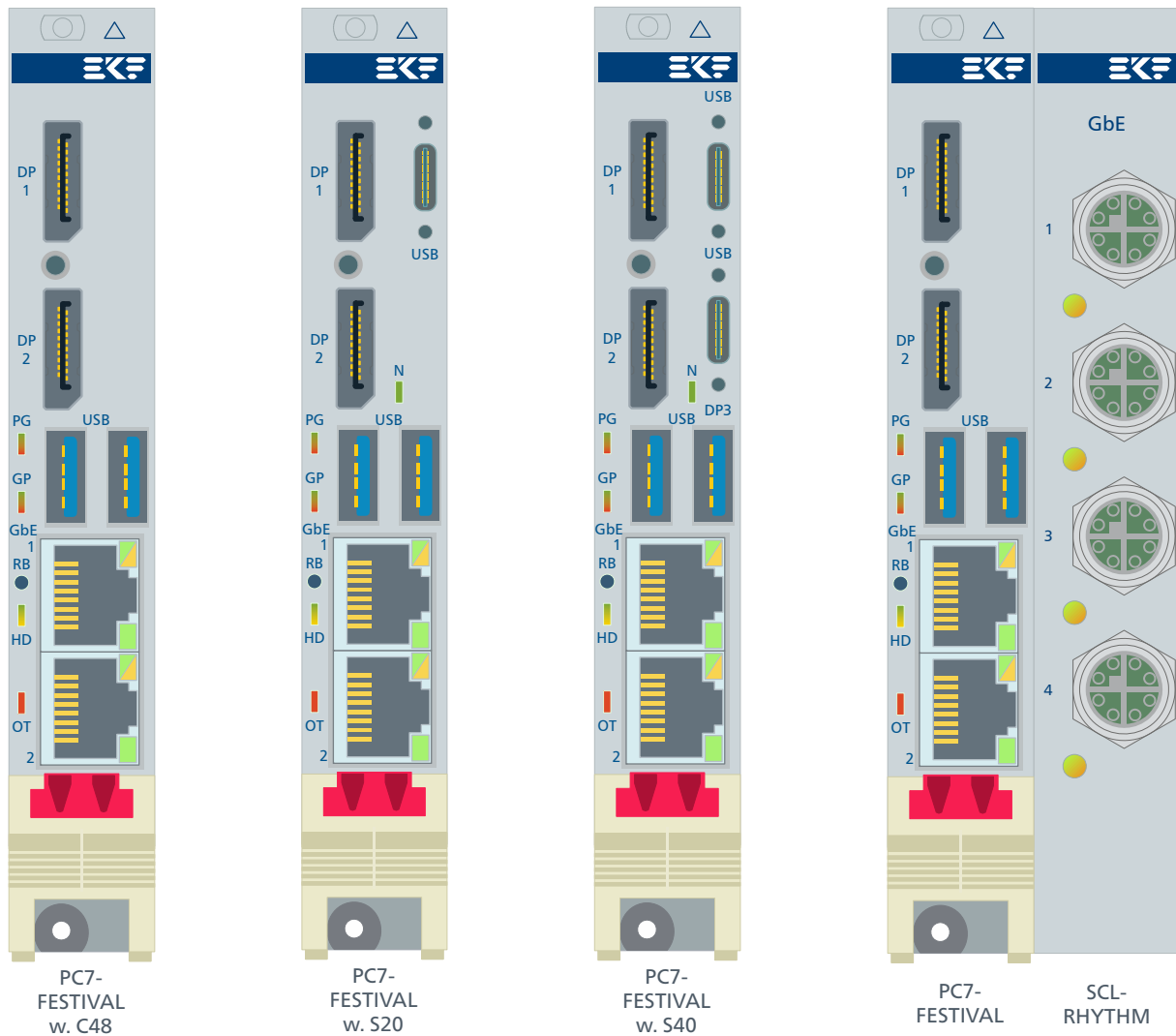


SRP-BLUBOXX

Block Diagram



Front Panel



Type-C Screw Lock

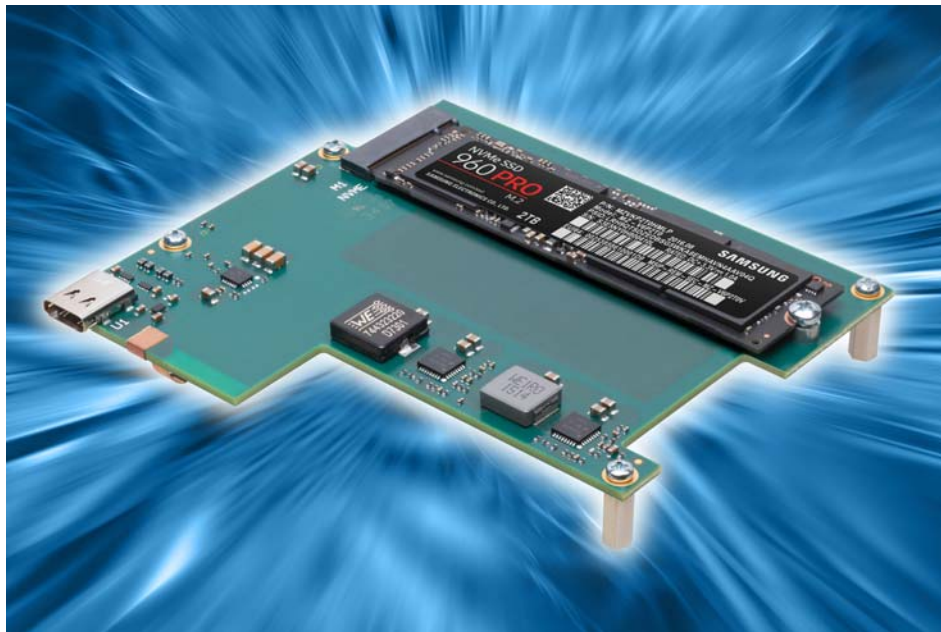
Low Profile Mezzanine Mass Storage 4HP



C48-M2 • Low Profile Mezzanine M.2 SATA SSD



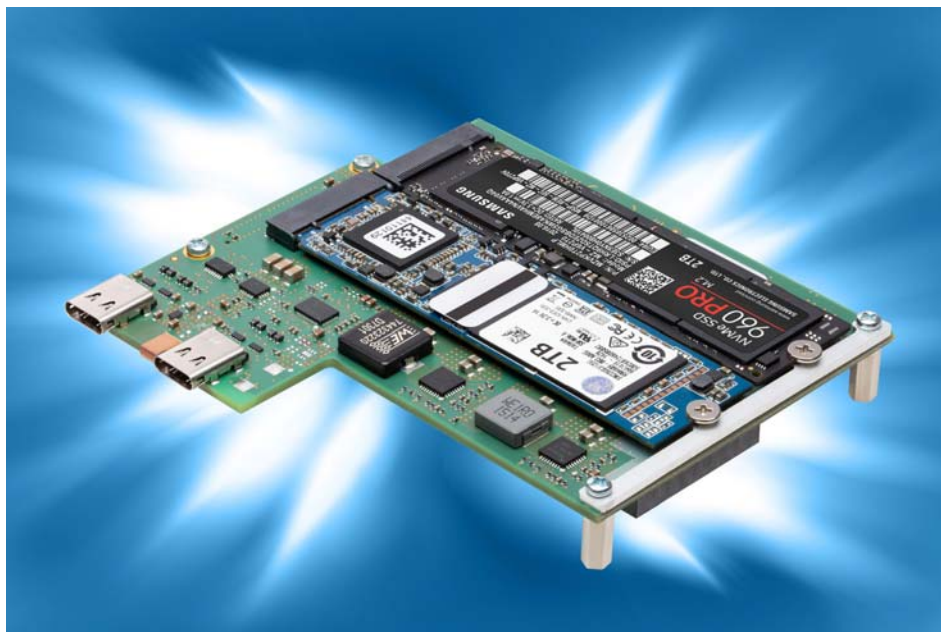
PC7-FESTIVAL w. C48-M2 Low Profile SSD Module



S20-NVME • Low Profile Mezzanine M.2 PCIe x4 SSD



PC7-FESTIVAL w. S20-NVME Low Profile SSD



S40-NVME • Low Profile Mezzanine M.2 PCIe x4 & M.2 SATA SSD



PC7-FESTIVAL w. S40-NVME

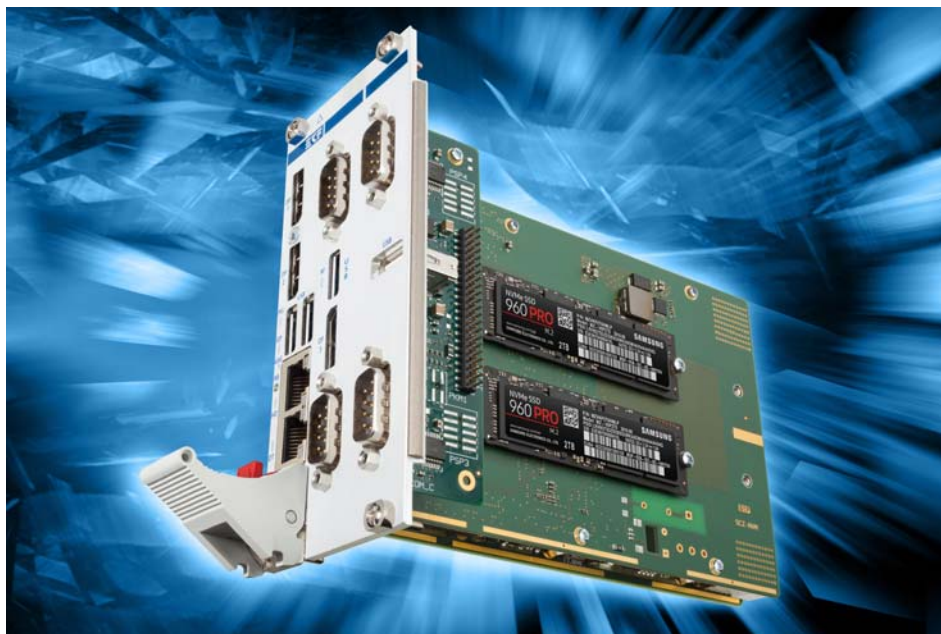
Side Card Assemblies 8/12HP



PC7-FESTIVAL w. P01-M12



PC7-FESTIVAL w. SCL-RHYTHM Side Card



PC7-FESTIVAL w. SCZ-NVM Side Card 8/12HP



12HP Assembly

Industrial Computers Made in Germany
boards. systems. solutions.

Beyond All Limits:
EKF High Performance Embedded

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