



Product Information

PC5-LARGO • CompactPCI® PlusIO • CPU Card

5th Generation Intel® Core™ Processor

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General

The PC5-LARGO is a rich featured high performance 4HP/3U CompactPCI® PlusIO CPU board, equipped with a 5th generation Intel® Core™ mobile processor (Broadwell quad-core). The PC5-LARGO front panel is provided with two Gigabit Ethernet jacks, two USB 3.0 receptacles, and two mDP connectors (DisplayPort 1.2 MST, 4k UHD).

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 PC5-LARGO can be equipped with up to 24GB DDR3L ECC RAM. Up to 8GB memory-down are provided for rugged applications, and another 16GB are available via the SO-DIMM socket. Low profile SSD mezzanine modules are available as on-board mass storage solution.

The PC5-LARGO backplane connectors comply with the PICMG® CompactPCI® PlusIO system slot specification, suitable for a rear I/O module or hybrid CompactPCI® Serial system via J2. Across J1, the PC5-LARGO 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 Mini 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

- ▶ 5th Generation Intel® Core™ CPU (Broadwell H)
- ▶ i7-5850EQ • 4 Cores • 2.7GHz (TB 3.4GHz) • 47/37W TDP/cTDP • GT3e-6200 Intel® Iris™ Pro graphics 1GHz • 6MB LLC • vPRO™/AMT
- ▶ i7-5700EQ • 4 Cores • 2.6GHz (TB 3.4GHz) • 47/37W TDP/cTDP • GT2-5600 Intel® HD graphics 1GHz • 6MB LLC • vPRO™/AMT

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 (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 24GB DDR3L 1600 +ECC
- ▶ DDR3L +ECC soldered memory up to 8GB
- ▶ DDR3L +ECC SO-DIMM memory module socket up to 16GB

Feature Summary

Graphics

- ▶ Integrated graphics engine, 3 symmetric independent displays
- ▶ 3D HW acceleration DX11.1, OpenCL 1.2, OpenGL 4.3, ES 2.0
- ▶ HW media acceleration DXVA 2, VAAPI
- ▶ HW video decode H264, SVC, AVC, MVC, MPEG-2, MJPEG, JPEG large frame support, VC-1, VP8
- ▶ HW video encode H264, SVC, AVC, MVC, MPEG-2
- ▶ Content protection PUMA, PAVP, HDCP
- ▶ Front panel options: Dual Mini-DisplayPort (mDP) or single VGA connector
- ▶ 3rd DisplayPort connector via mezzanine side card optional
- ▶ DisplayPort[™] 1.2 Multi-Stream Transport (MST) - display daisy chaining
- ▶ Max Resolution 4096 x 2304 @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 PC5-LARGO 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 5th Gen processor series (Intel® AES-NI)

Front Panel I/O (4HP)

- ▶ 2 x Gigabit Ethernet RJ45 (1 = PCH & I217LM - Intel® AMT support, 2 = I210IT)
- ▶ 2 x DisplayPort (from processor integrated HD graphics engine, mDP style receptacles, optional cable connector retainer available)
- ▶ 2 x USB 3.0 Type-A

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 PC5-LARGO 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 (PC5-480D)
- ▶ 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 changes w/o further notice

Related Information

PC5-LARGO Home	www.ekf.com/p/pc5/pc5.html
PC5-LARGO User Guide	www.ekf.com/p/pc5/pc5_ug.pdf

Related Documents CompactPCI® Serial & CompactPCI® PlusIO

CompactPCI® Serial & PlusIO Overview	www.ekf.com/s/smart_solution.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

C40 ... C48 Series Mezzanine Storage Modules	www.ekf.com/c/ccpu/c4x_mezz_ovw.pdf
C48-M2 Dual M.2 SATA SSD Mezzanine Storage Module	www.ekf.com/c/ccpu/c48/c48.html
PCL-CAPELLA Mezzanine Side Card	www.ekf.com/p/pcl/pcl.html
PCS-BALLET Mezzanine Side Card	www.ekf.com/p/pcs/pcs.html
SCS-TRUMPET Mezzanine Side Card	www.ekf.com/s/scs/scs.html

Ordering Information

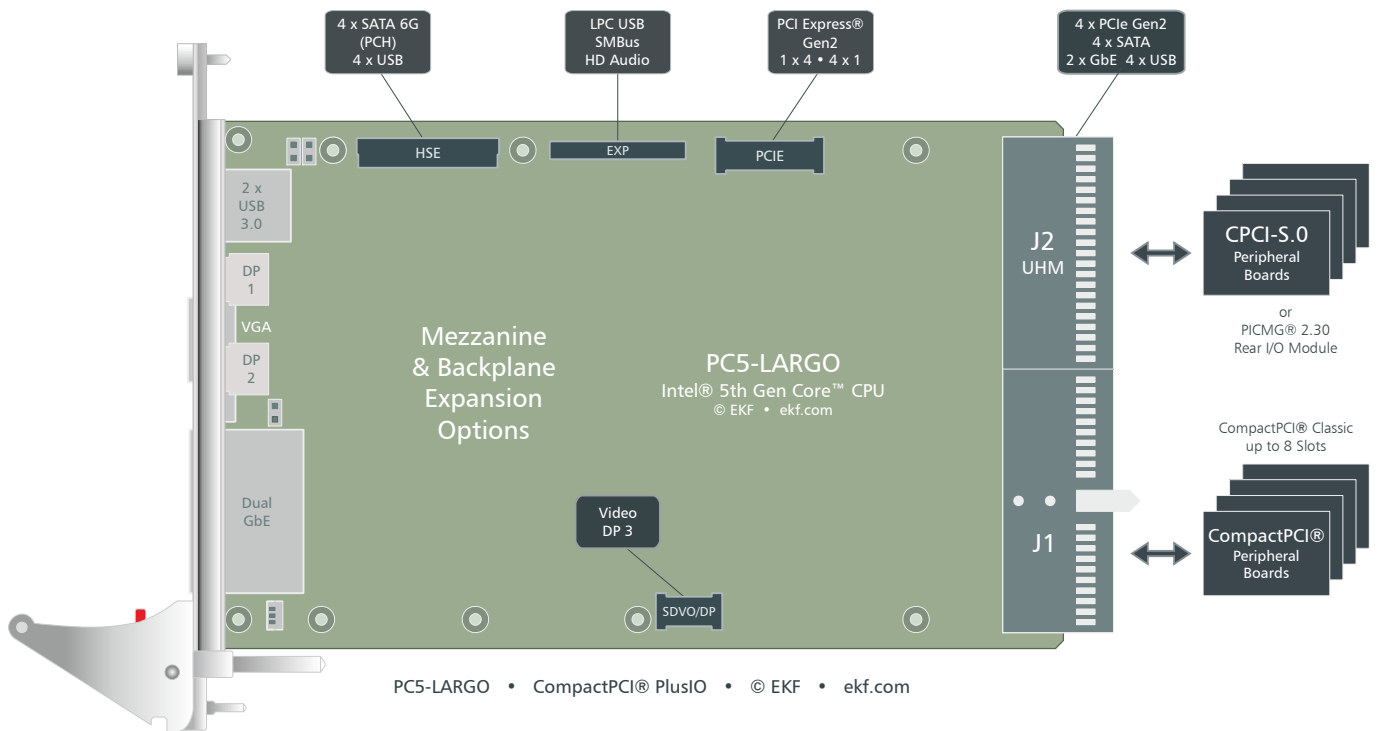
For popular PC5-LARGO SKUs please refer to www.ekf.com/liste/liste_21.html#PC5

For popular Mezzanine Side Cards please refer to www.ekf.com/liste/liste_20.html#C40

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, Gigabit Ethernet and USB) are passed from the PC5-LARGO through the special UHM 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 PC5-LARGO in the middle as controller for both backplane segments, combining the technologies of both worlds.



PC5-LARGO • System Expansion Options

Mezzanine Expansion

The PC5-LARGO 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 PC5-LARGO 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 PC5-LARGO 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.



C48-M2 SATA SSD Low Profile Mezzanine Module



Sample CompactPCI® PlusIO Rack





Expansion Interface for Low Profile SSD Mezzanine

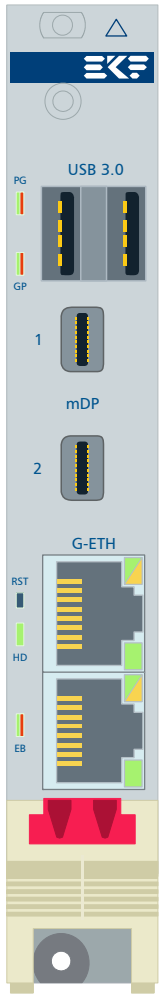


Mezzanine Expansion Interface Connectors for 8HP Assembly



PC5-LARGO w. Side Card 8HP Assembly

Sample Front Panel Options

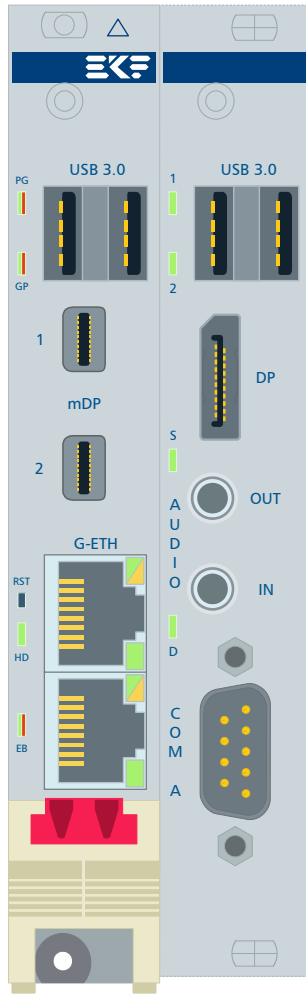


PC5-LARGO
Dual - mDP

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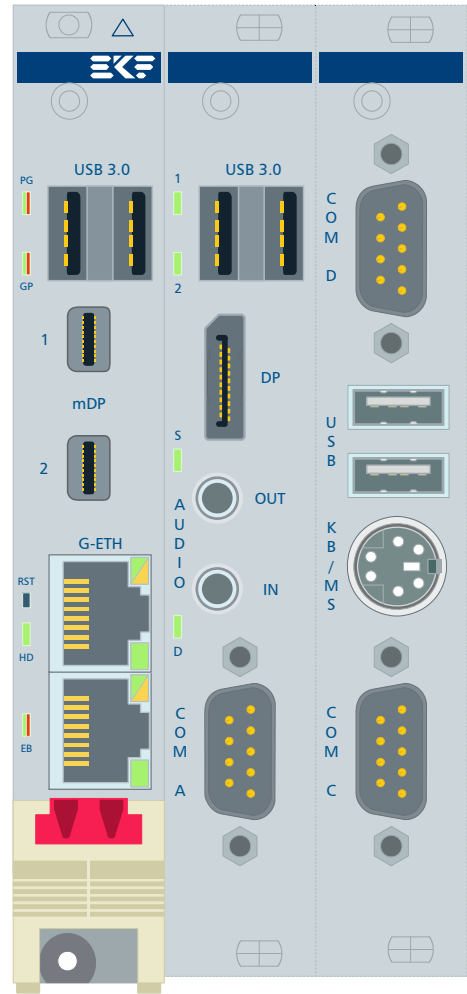


PC5-LARGO
VGA



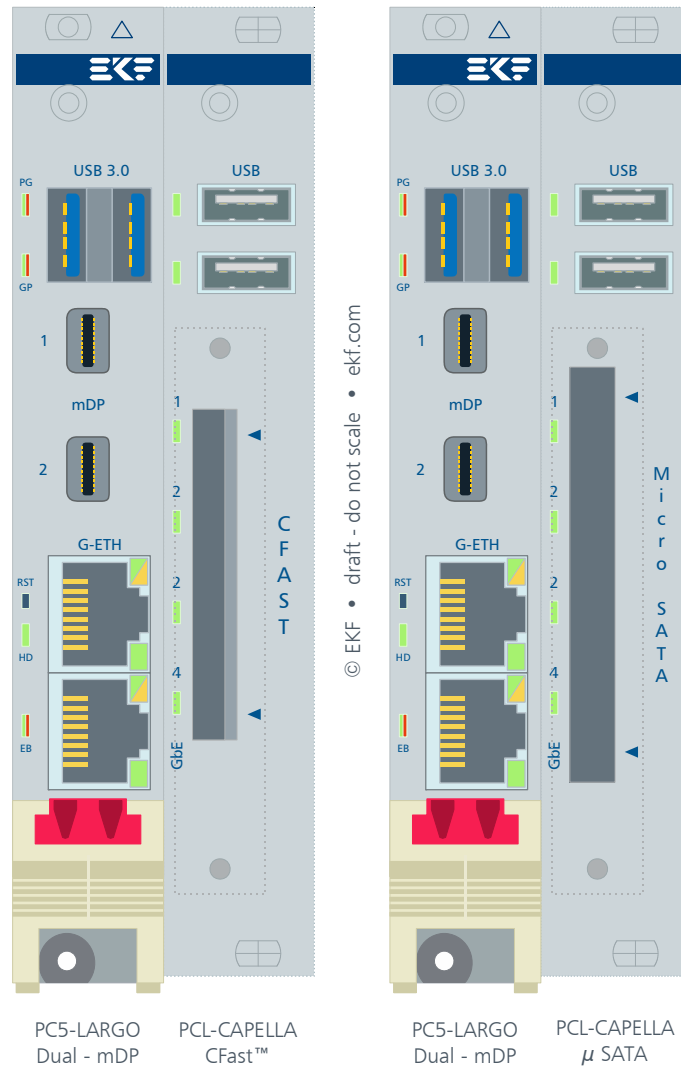
PC5-LARGO
Dual - mDP PCS-BALLET
RS-232

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Dual - mDP PCS-BALLET
RS-232 C32-FIO

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Screw Locking for mDP Connectors



Option Screw-Lock Plate for mDP Cable Connectors

The front panel is provided with a threaded hole for fixing an 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).



Screw-Locked mDP Connector Cable Assembly (Delock)



Beyond All Limits: EKF High Performance Embedded

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