SYSTEM

Product Information

PCX-JAM • SXP-JAM
CompactPCI® Serial to CompactPCI® Classic Bridge

Backplane Coupler Dual Board Assembly
CompactPCI® System Slot Card • CompactPCI® Serial Peripheral Card

General

Available as companion boards, the PCX/SXP-JAM assembly is a bridging and expansion solution for CompactPCI® Serial systems with need for integrating CompactPCI® Classic cards. While the SXP-JAM is a CompactPCI® Serial board which resides on the outmost peripheral slot of the Serial backplane, the PCX-JAM is configured as system slot card for the CompactPCI® Classic backplane. Both boards are connected together by a mezzanine stacking connector, which is used to forward a PCI Express® link from the SXP-JAM to a PCI® bridge on the PCX-JAM. Mounted together in a 4HP pitch, the PCX/SXP-JAM boards expand a modern CompactPCI® Serial system by up to seven CompactPCI® Classic card slots.

When using either two adjacent separate standard backplanes CompactPCI® Classic and CompactPCI® Serial, or alternatively a custom hybrid backplane, both PCX/SXP-JAM cards will be aligned together in a 4HP pitch (8HP front panel width assembly). The PCX-JAM resides left of the SXP-JAM, requiring the systems slots of both backplane segments to be right aligned.

In addition to the 32bit 33/66MHz PCI® bridge, the PCX-JAM is provided with three RJ45 Gigabit Ethernet jacks (Intel® I210-IT controllers) for industrial networking, and three USB 3.0 Type-A receptacles (TI USB controller). Further more, the SXP-JAM can accommodate an SATA SSD module, size M.2 up to 22110.

Feature Summary

General

- Dual board assembly
- PCX-JAM is a CompactPCI® (PICMG® CPCI 2.0) system slot board
- SXP-JAM is a CompactPCI® Serial (PICMG® CPCI-S.0) peripheral card
- Form factor single size Eurocard (board dimensions 100x160mm^2)
- Mounting height 3U
- Common front panel width 8HP for the assembly of both cards
- High speed mezzanine connectors between both cards

PCX-JAM

- CompactPCI® Classic system slot board (replaces CompactPCI® CPU card)
- Must reside rightmost on a CompactPCI® backplane which has its system slot right aligned
- CompactPCI® backplane communication via J1 and J2 hard metric connectors, 32-bit support
- PCI Express® to PCI® bridge PI7C9X112, 3.3V or 5V V_{IO}
- Support for up to 7 CompactPCI® peripheral cards
- On-board PCI Express® switch PI7C9X2G606PR
- +5V only board design for low cost CompactPCI® system power supply
- PCX-JAM can deliver +3.3V to CompactPCI® peripheral boards
- Added value front panel I/O connectors (3 x USB3, 3 x GbE)
- On-board 3 x I210-IT Gigabit Ethernet networking controllers
- On-board USB 3.0 quad port controller TUSB7340

SXP-JAM

- CompactPCI® Serial peripheral card, backplane communication via P1 connector
- Must reside leftmost on a CompactPCI® Serial backplane with its system slot right aligned
- PCI Express® x1 or x4 enabled peripheral card slot required (Gen2 or Gen3 recommended)
- PCIe® x1 Gen2 sufficient for operation w. PCX-JAM
- PCIe® x4 Gen3 path provided for future projects
- On-board PCIe® redrivers for optimum signal integrity
- Option on-board M.2 SATA SSD socket (SATA enabled peripheral card slot required)
- Option CompactPCI® Serial backplane connector P6 populated for even more mechanical ruggedness

Front Panel I/O

- 3 x Gigabit Ethernet RJ45 (3 x I210-IT)
- 3 x USB 3.0 Type-A (TUSB7340)

Feature Summary

Networking

- Three networking interface controllers (NIC), PCIe® based
- 1000BASE-T, 100BASE-TX, 10BASE-T connections
- Intel® I210-IT -40°C to +85°C operating temperature GbE controllers w. integrated PHY
- 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
- Three GbE ports via RJ45 front panel jacks

USB

- TI quad port USB controller, PCIe® based
- USB 3.1 Gen1 (formerly USB 3.0) 5Gbps SuperSpeed
- Three front panel Type-A connectors

PCI Express®

- PCIe® Gen2 packet switch PI7C9X2G606PR (6-port, 6-lane) located on PCX-JAM
- Upstream port x1 to CompactPCI® Serial backplane via SXP-JAM P1 connector
- 3 x downstream ports x1 to Gigabit Ethernet controllers Intel® I210IT (front panel)
- Downstream port x1 to USB controller TUSB7340
- Downstream port x1 to PCI® bridge PI7C9X112 (7 x PCI 33/66MHz CompactPCI® peripheral slots)
- PCIe® Gen3 redrivers on SXP-JAM

SSD

- M.2 SATA socket (B-key), suitable for an SATA based SSD module
- Any size 2230 - 22110
- Located on the SXP-JAM
- SATA via CompactPCI® Serial backplane (SXP-JAM P1 connector)

Feature Summary

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 -40°C to +85°C industrial temperature range (SSD may differ, refer to manufacturer)
- 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 88.8 years (SXP-JAM), 34.7 years (PCX-JAM)
- EC Regulatory EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)

Applications

- Legacy hardware integration into modern CompactPCI® Serial systems
- Enables special PCI® functions w/o an equivalent PCIe® solution
- Replacement solution for obsolete CompactPCI® Classic CPU cards
- Modern CompactPCI® Serial CPU card controls both backplane segments
- Useful front I/O in addition to basic backplane bridge function

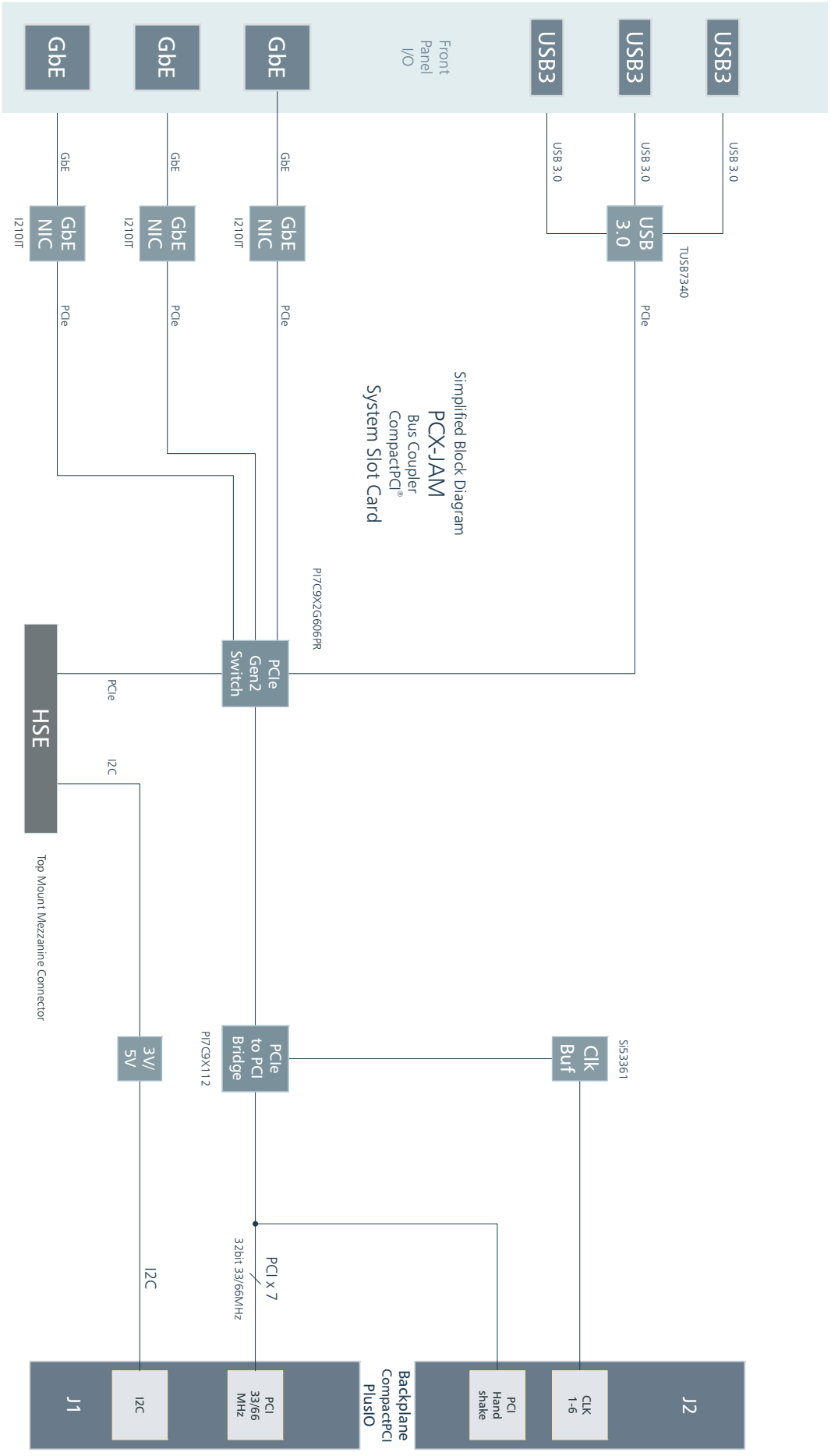
all items are subject to changes

Related Information	
PCX-JAM & SXP-JAM	www.ekf.com/p/pcx/pcx.html www.ekf.com/s/sxp/sxp.html
CompactPCI® PlusIO	www.ekf.com/p/plus.html
CompactPCI® Serial	www.ekf.com/s/serial.html

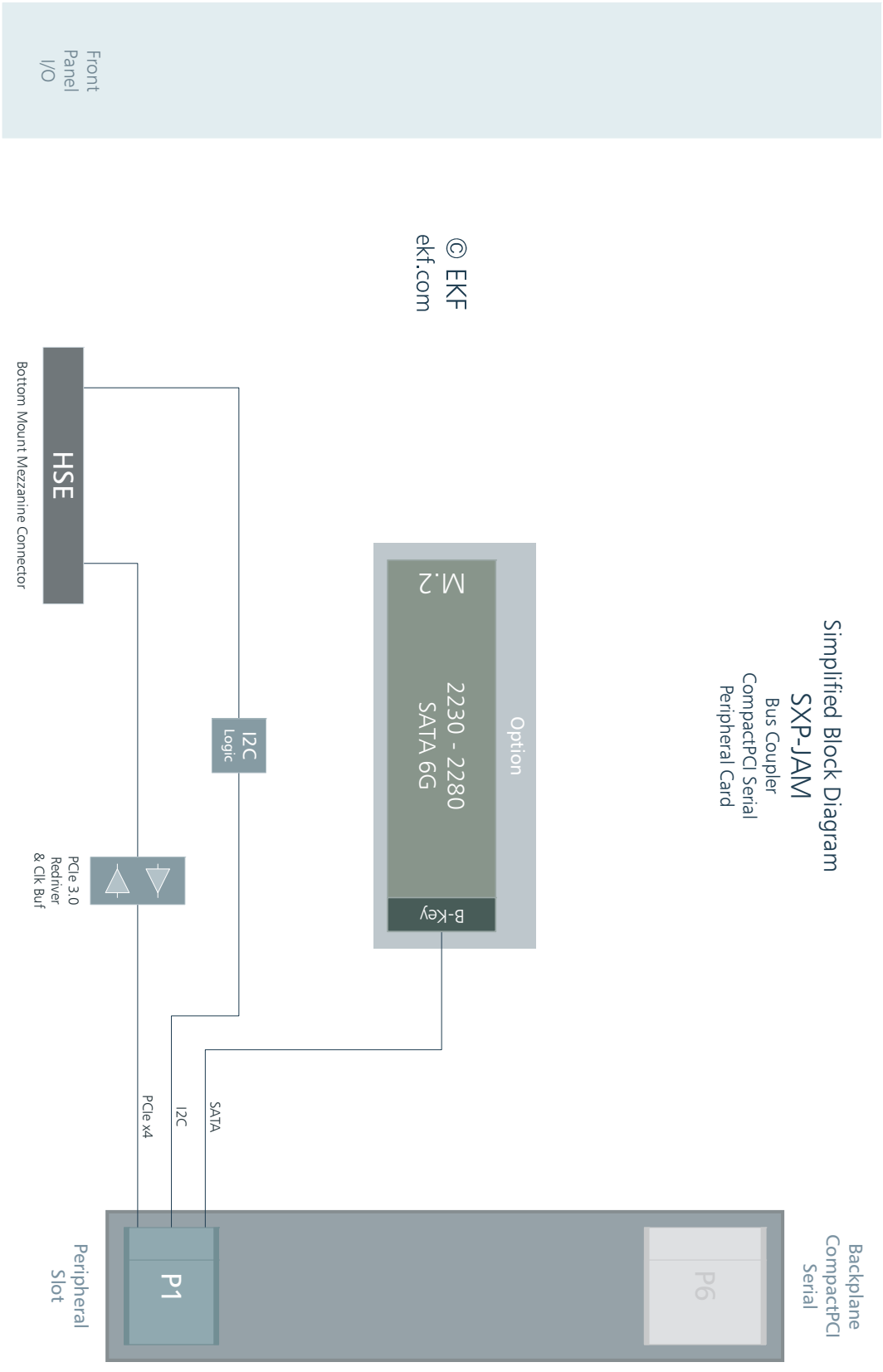
Ordering Information

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

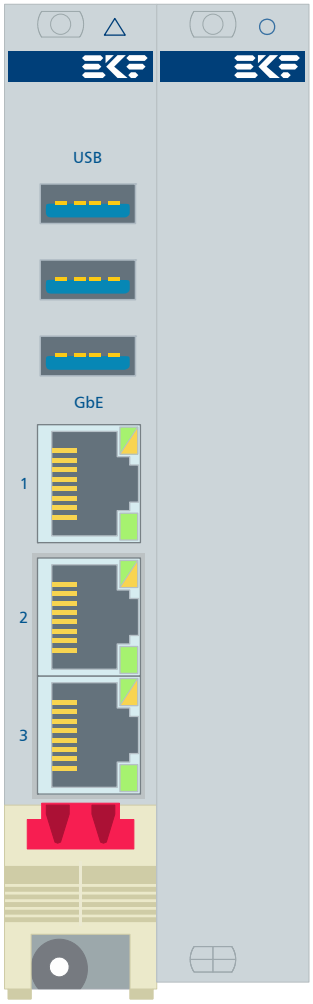
Block Diagram PCX-JAM



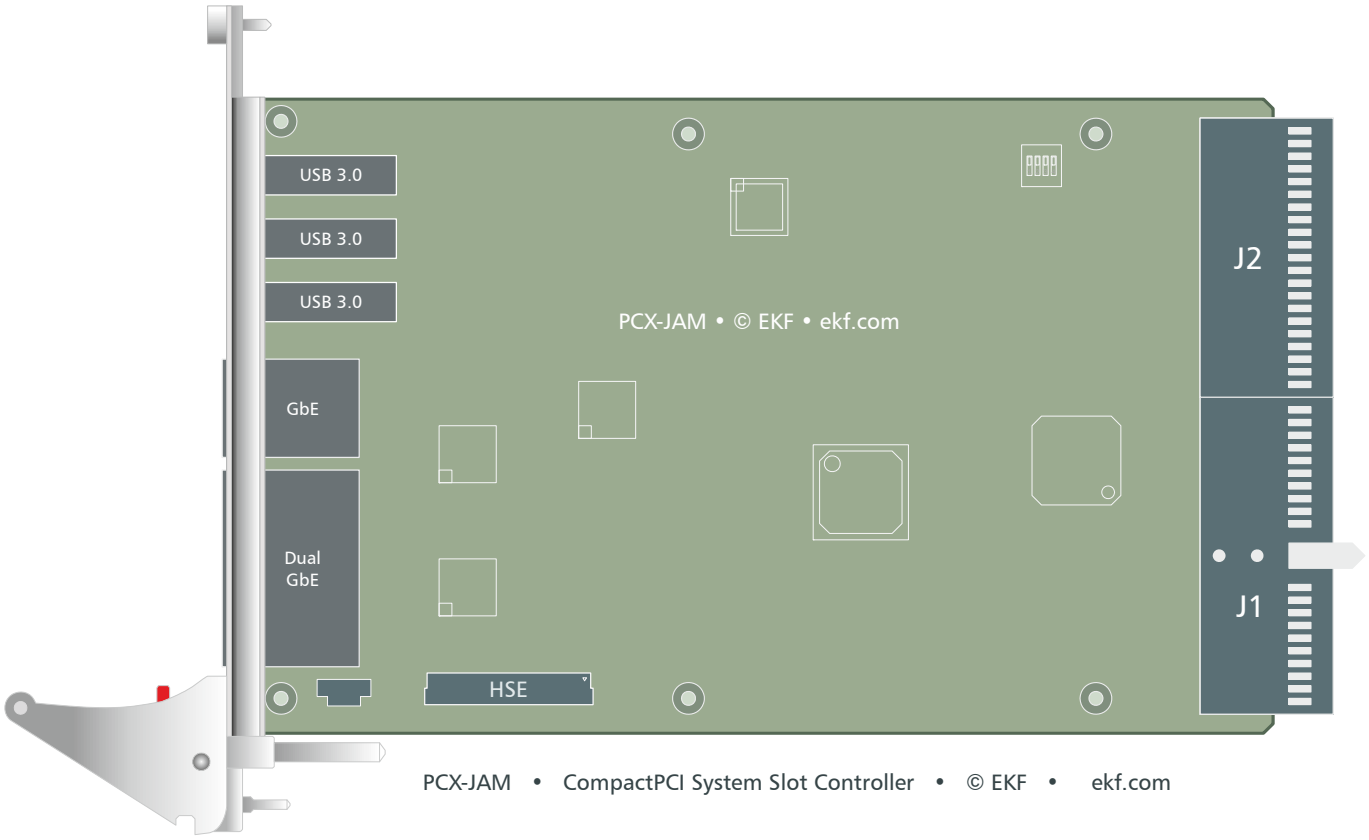
Block Diagram SXP-JAM



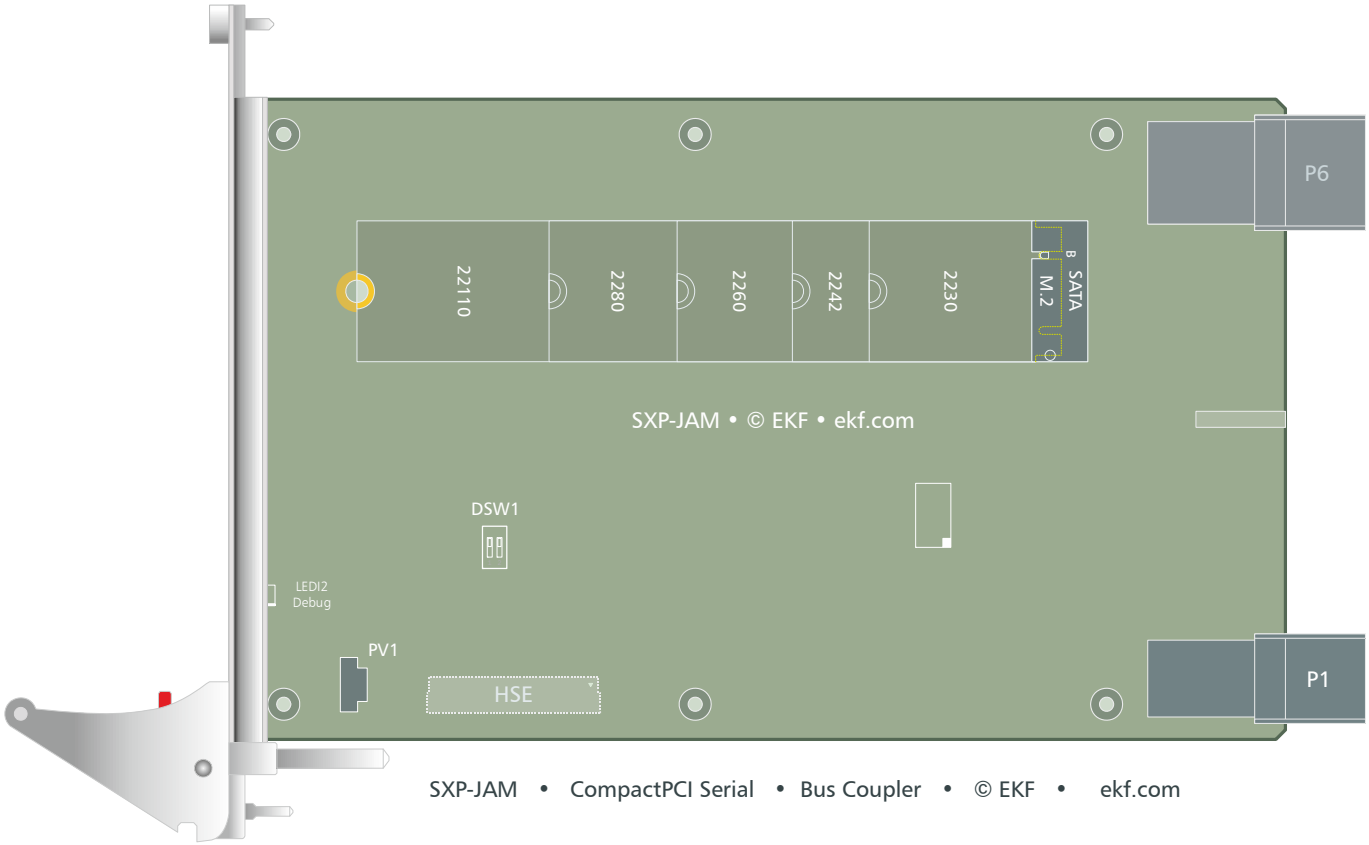
Front Panel



Component Assembly



PCX-JAM • CompactPCI System Slot Controller • © EKF • ekf.com



SXP-JAM • CompactPCI Serial • Bus Coupler • © EKF • ekf.com

PCX-JAM Backplane Connectors

J1	A	B	C	D	E
25	5V	REQ64# [2]	ENUM# [2]	3.3V [9]	5V
24	AD1	5V	V(I/O)	AD0	ACK64# [2]
23	3.3V [9]	AD4	AD3	5V	AD2
22	AD7	GND	3.3V [9]	AD6	AD5
21	3.3V [9]	AD9	AD8	M66EN [7]	C/BE0#
20	AD12	GND	V(I/O)	AD11	AD10
19	3.3V [9]	AD15	AD14	GND	AD13
18	SERR# [1]	GND	3.3V [9]	PAR	C/BE1#
17	3.3V [9]	IPMB SCL [3]	IPMB SDA [3]	GND	PERR# [1]
16	DEVSEL# [1]	GND	V(I/O)	STOP# [1]	LOCK# [1]
15	3.3V [9]	FRAME# [1]	IRDY# [1]	BD_SEL# [6]	TRDY# [1]
14	KEY AREA (not keyed)				
13					
12					
11	AD18	AD17	AD16	GND	C/BE2#
10	AD21	GND	3.3V [9]	AD20	AD19
9	C/BE3#	NC *IDSEL*	AD23	GND	AD22
8	AD26	GND	V(I/O)	AD25	AD24
7	AD30	AD29	AD28	GND	AD27
6	REQ# [1]	GND	3.3V [9]	CLK	AD31
5	*BRSVP1A5* [4]	*BRSVP1B5* [4]	RST#	GND	GNT#
4	IPMB PWR (+5V) [3]	GND *HEALTHY#*	V(I/O)	INTP [2]	INTS [2]
3	INTA# [1]	INTB# [1]	INTC# [1]	5V	INTD# [1]
2	*TCK* [4]	5V	*TMS* [4]	*TDO* [4]	*TDI* [4]
1	5V	-12V [5]	*TRST#* [4]	+12V [8]	5V

1) Various PCI® control signals pulled up with 1kΩ to V(I/O). This value is specified for +5V V(I/O) but works as well with +3.3V V(I/O) under all environments which have been tested by EKF. On request, 2.7kΩ P/U resistors can be stuffed.
2) Not used, though pulled up with 1kΩ to V(I/O).
3) IPMB SCL and SDA via level shifter, pulled up with 2.7k to J1 pin A4 IPMB_PWR (+5V). IPMB_PWR can be sourced externally, and is also supplied by the PCX-JAM across a Schottky diode.
4) All JTAG pins are NC since discouraged by CPCI specification Rev. 3.0
5) -12V connected to a decoupling capacitor only and not used on PCX-JAM
6) BD_SEL# is not connected
7) M66EN is detected by the PCI bridge in order to allow either 66MHz PCI backplane operation, or when pulled low (by peripheral board) forces 33MHz clock. Please note that the PCI bridge can be setup also for 50MHz and 25MHz on customer request (resistor stuffing option). When operating in 66MHz (50MHz) a V(I/O) voltage of +3.3V is mandatory.
8) +12V connected to a decoupling capacitor only and not used on PCX-JAM
9) The 3.3V pins can be sourced by the PCX-JAM itself (power output via resettable fuse 2.0A), for +5V only power supply designs (consider 3.3V power requirements of peripheral boards).

J2	A	B	C	D	E
22	*GA4* [2]	*GA3* [2]	*GA2* [2]	*GA1* [2]	*GA0* [2]
21	CLK6	GND			
20	CLK5	GND			
19	GND	GND			
18					
17			PRST# [1] [4]	REQ6# [1]	GNT6#
16			DEG# [1] [4]	GND	*reserved* [2]
15			FAL# [1] [4]	REQ5# [1]	GNT5#
14					
13					
12					
11					
10					
9					
8					
7					
6					
5					
4	V(I/O)				*reserved* [2]
3	CLK4	GND	GNT3#	REQ4# [1]	GNT4#
2	CLK2	CLK3	SYSEN# [3]	GNT2#	REQ3# [1]
1	CLK1	GND	REQ1# [1]	GNT1#	REQ2# [1]

1) Various PCI control signals pulled up with 1kΩ to V(I/O). This resistor value is specified for +5V V(I/O) but works as well with +3.3V V(I/O) under all environments which have been tested by EKF. On request, 2.7kΩ P/U resistors can be stuffed.
2) GA pins and some other signals are not connected
3) SYSEN# is pulled up with 10kΩ to +3.3V
4) Signals terminated by P/U resistors, but not in use

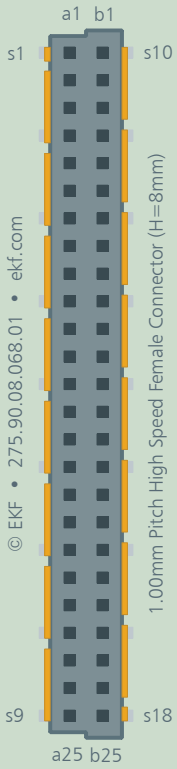
SXP-JAM Backplane Connector

P1	A	B	C	D	E	F	G	H	I	J	K	L
6	GND	1 PE TX02+ 1)	1 PE TX02- 1)	GND	1 PE RX02+ 1)	1 PE RX02- 1)	GND	1 PE TX03+ 1)	1 PE TX03- 1)	GND	1 PE RX03+	1 PE RX03-
5	1 PE TX00+	1 PE TX00-	GND	1 PE RX00+	1 PE RX00-	GND	1 PE TX01+	1 PE TX01-	GND	1 PE RX01+	1 PE RX01-	GND
4	GND	1 USB2+	1 USB2-	GND	PE_ CLKIN+	PE_ CLKIN-	GND	1 SATA TX+	1 SATA TX-	GND	1 SATA RX+	1 SATA RX-
3	1 USB3 TX+	1 USB3 TX-	GA0	1 USB3 RX+	1 USB3 RX-	GA1	SATA SDI	SATA SDO	GA2	SATA SCL	SATA SL	GA3
2	GND	I2C SCL	I2C SDA	GND	*RSV*	*RSV*	GND	RST#	*WAKE_ OUT#*	GND	PCIE_ EN#	*SYS EN#*
1	+12V	+5V STBY	GND	+12V	+12V	GND	+12V	+12V	GND	+12V	+12V	GND

1) PCIe® lanes 1-3 routed to Gen3 redriver and mezzanine connector for future projects - not used however on companion board PCX-JAM (link width x1)

As an option, the backplane connector P6 may be also stuffed for rugged applications (additional mechanical stability). The P6 pin assignment is not illustrated here, since only GND pins are wired and all other pin positions are NC. A corresponding backplane with J6 populated would be required.

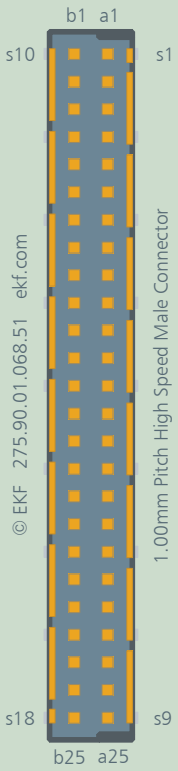
PCX-JAM Mezzanine Connector



High Speed Expansion HSE (female 8mm)			
1_PCIE_TXP	a1	b1	
1_PCIE_TXN	a2	b2	
GND	a3	b3	GND
1_PCIE_RXN	a4	b4	
1_PCIE_RXP	a5	b5	
GND	a6	b6	GND
	a7	b7	
	a8	b8	
GND	a9	b9	GND
	a10	b10	
	a11	b11	
GND	a12	b12	GND
	a13	b13	
	a14	b14	
GND	a15	b15	GND
	a16	b16	
	a17	b17	
GND	a18	b18	GND
PCIE_CLK_P	a19	b19	
PCIE_CLK_N	a20	b20	
GND	a21	b21	
I2C_SCL	a22	b22	HOTSWP#
I2C_SDA	a23	b23	PLTRST#
+12V	a24	b24	*+12V*
+12V	a25	b25	*+12V*

+12V not attached

SXP-JAM Mezzanine Connector



High Speed Expansion HSE (male 10mm)			
3_PCIE_TXP	b1	a1	1_PCIE_TXP
3_PCIE_TXN	b2	a2	1_PCIE_TXN
GND	b3	a3	GND
3_PCIE_RXN	b4	a4	1_PCIE_RXN
3_PCIE_RXP	b5	a5	1_PCIE_RXP
GND	b6	a6	GND
4_PCIE_TXP	b7	a7	2_PCIE_TXP
4_PCIE_TXN	b8	a8	2_PCIE_TXN
GND	b9	a9	GND
4_PCIE_RXN	b10	a10	2_PCIE_RXN
4_PCIE_RXP	b11	a11	2_PCIE_RXP
GND	b12	a12	GND
	b13	a13	
	b14	a14	
GND	b15	a15	GND
	b16	a16	
	b17	a17	
GND	b18	a18	GND
	b19	a19	PCIE_CLK_P
	b20	a20	PCIE_CLK_N
	b21	a21	GND
HOTSWP#	b22	a22	SMB_SCL
PLTRST#	b23	a23	SMB_SDA
+12V	b24	a24	+12V
+12V	b25	a25	+12V

PCIe® lanes 2-4 attached to the mezzanine connector for future projects - not used however on companion board PCX-JAM (link width x1)

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Beyond All Limits:
EKF High Performance Embedded

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EKF Elektronik GmbH
Philipp-Reis-Str. 4 (Haus 1)
Lilienthalstr. 2 (Haus 2)
59065 HAMM
Germany

Phone +49 (0)2381/6890-0
Fax +49 (0)2381/6890-90
Internet www.ekf.com
E-Mail sales@ekf.com