EKF
SYSTEM

Product Information

CompactPCI® Express (PXI *Express™*) • EB3-TONE

Quad Port USB 3.0 Hostadapter

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General

The EB3-TONE is a peripheral slot board for CompactPCI® Express (aka PXI Express™) systems, equipped with a quad port USB 3.0 host controller. All four USB connectors are available from the front panel for attachment of external USB devices.

The EB3-TONE can be installed into any peripheral slot of a CompactPCI® Express or PXI Express™ backplane. The front panel USB 3.0 host connectors can deliver up to 1.5A V_{BUS} (+5V) each.
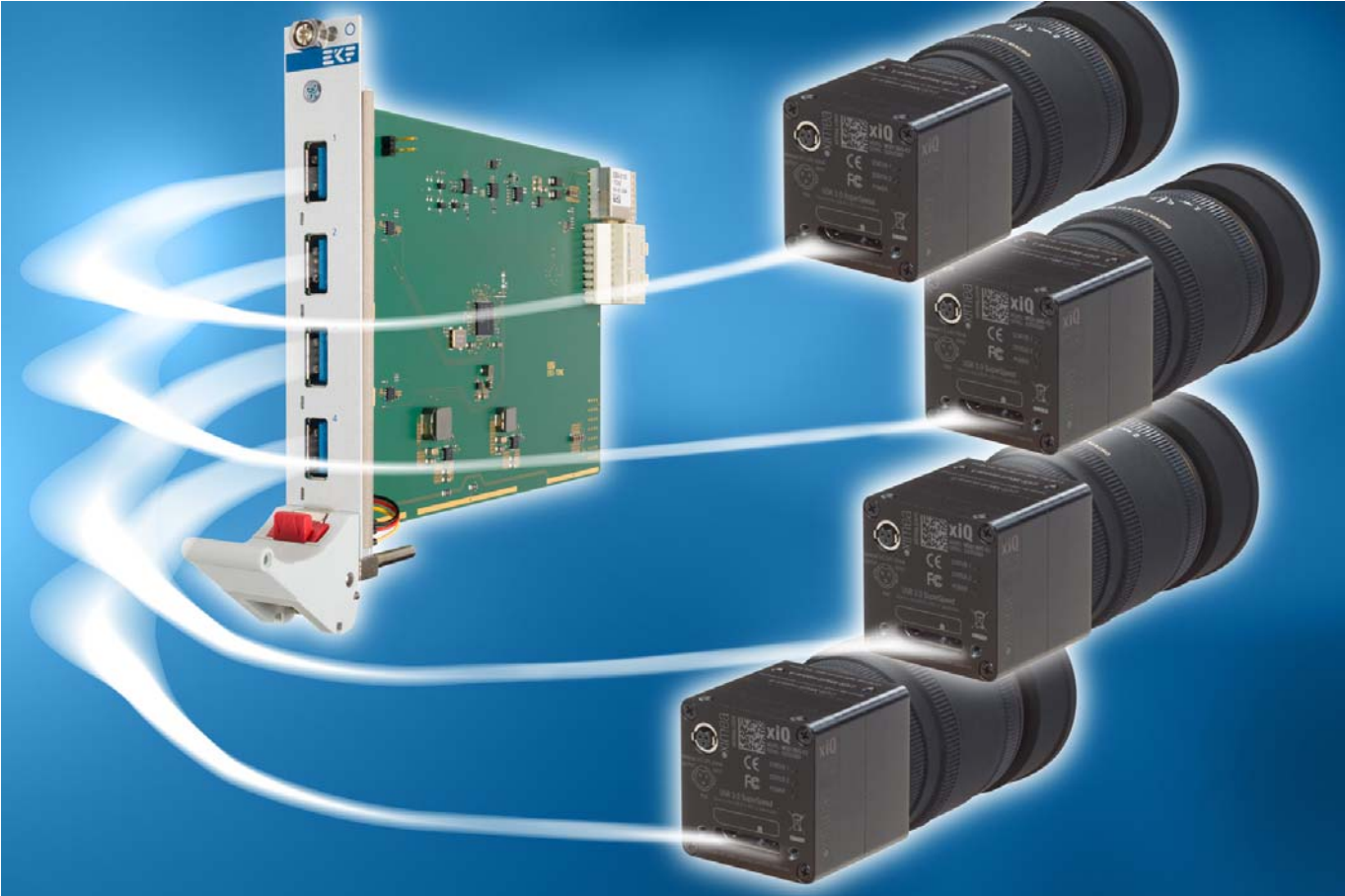

EB3-TONE

Feature Summary

General

▸ PICMG® CompactPCI® Express standard (EXP.0) peripheral slot card type 1 or type 2

▸ PXI Express™ peripheral slot card

▸ Single Size Eurocard 3U 4HP 100x160mm^2

▸ Backplane connectors XJ3, XJ4 (type 2 peripheral slot)

▸ Option backplane connector XP1+12V power (type 1 peripheral slot)

▸ CompactPCI® Express backplane connector XJ4 with F2 key for CompactPCI® Express & PXI Express™ systems (F1 key available on request)

▸ PCIe x 1 upstream - Gen2 (5.0Gbps) required for optimum performance

USB Interfaces

▸ Texas Instruments PCI Express® to quad-port USB 3.0 controller TUSB7340

▸ PCI Express® x 1 Gen2 interface for optimum performance

▸ USB 3.0 xHCI (eXtensible host controller interface) SuperSpeed supported

▸ USB 2.0 high-speed, full-speed, low-speed supported

▸ 4 x front panel Type A USB 3.0 host connectors

▸ V_{BUS} (+5V) 1.5A high current power switches individually assigned to front panel connectors (may require a backplane slot populated w. XJ1 power connector, dependent of the total external load via V_{BUS})
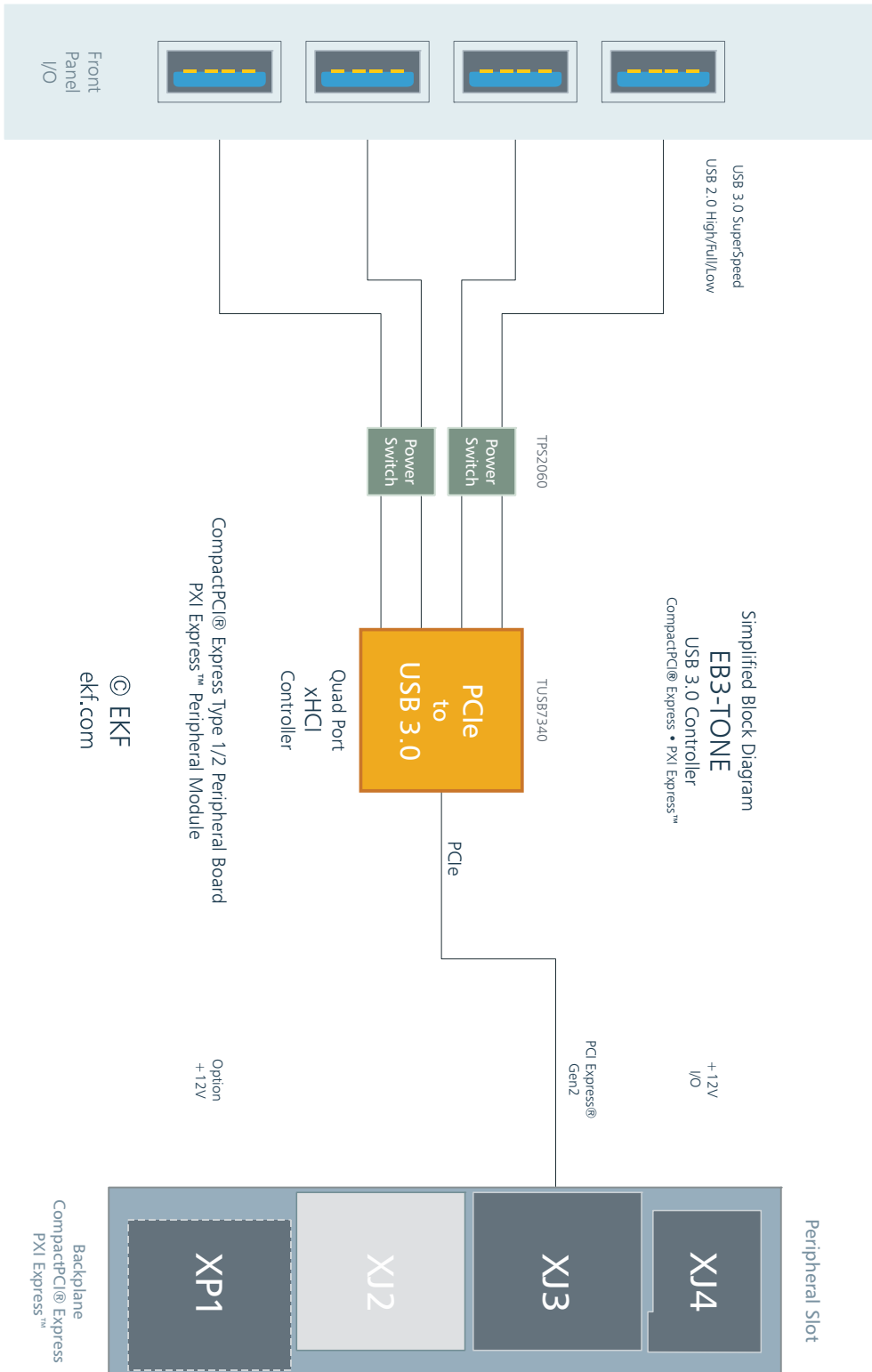
Environment & Regulation

▸ Designed & manufactured in Germany

▸ ISO 9001 certified quality management

▸ Long term availability

▸ Rugged solution (coating, sealing, underfilling on request)

▸ RoHS compliant

▸ Operating temperature: -40°C to +85°C (industrial temperature range)

▸ 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 65.8 years

▸ EC Regulations EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)

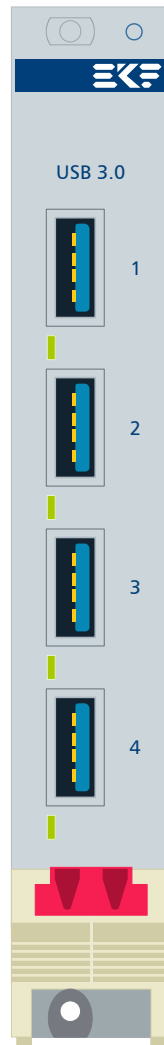Application Example - Vision System w. EB3-TONE

Block Diagram

Front Panel I/O

USB 3.0 SuperSpeed
USB 2.0 High/Full/Low

Power Switch

Power Switch

TPS2060

Quad Port xHCI Controller

PCIe to USB 3.0

TUSB7340

PCIe

Simplified Block Diagram
EB3-TONE
USB 3.0 Controller
CompactPCI® Express • PXI Express™

CompactPCI® Express Type 1/2 Peripheral Board
PXI Express™ Peripheral Module

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Option +12V

PCI Express® Gen2

+12V I/O

Backplane
CompactPCI® Express
PXI Express™

XP1

XJ2

XJ3

XJ4

Peripheral Slot

Front Panel

USB 3.0

1

2

3

4

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EB3-TONE

LED Function

Green - USB Power

Please note: The front handle is provided with a built-in microswitch, which is used to disable the on-board power circuit when released. Vice versa, the *on-board devices are enabled not before the handle gets locked*. Please refer to the illustration below and make sure that the eject lever has reached its final position for proper board operation, as shown in picture 8. A gentle click should be audible, when the red actuator pin moves into its raised position, indicating that the board is locked and ready for use.
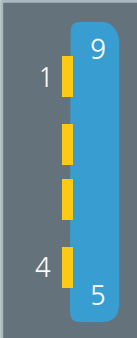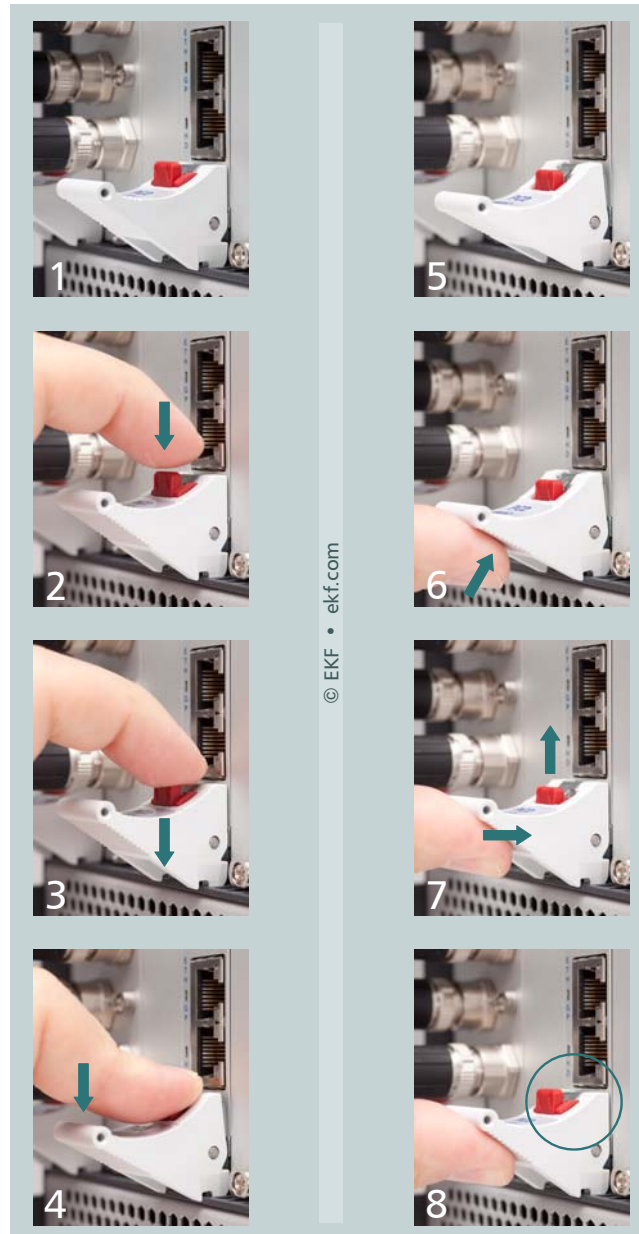
1 - 4: remove board
5 - 8: install board

1 & 8: on-board power enabled
2-7: on-board power disabled

Front Panel Connectors

The EB3-TONE is equipped with four front panel receptacles for USB 3.0 or USB 2.0 type A cable connectors (USB root hub). When connected to USB 2.0 compliant devices, only the classic 4 contacts (data pair, +5V V_{BUS} and GND) are in use. USB 3.0 devices in addition communicate via the SuperSpeed differential transmit and receive signal pairs, available across another 5 contact pins. Since all four EB3-TONE USB ports share a common SuperSpeed xHCI controller, do not expect the maximum USB 3.0 data transfer rate to be available on all connectors simultaneously.

USB 3.0 Receptacles		
270.23.09.1 © EKF • ekf.com	1	V_{BUS} +5V 1.5Amax
	2	USB D-
	3	USB D+
	4	GND
	5	SS RX-
	6	SS RX+
	7	GND
	8	SS TX-
	9	SS TX+

Each EB3-TONE USB connector provides +5V (V_{BUS}) for powering external devices. Electronic switches limit the maximum output current of each individual USB connector to a safe level. Front panel LEDs are provided to indicate the power state and initialization status of each F/P USB port.

Please note, that V_{BUS} is generated by an on-board +12V to +5V DC/DC power converter. In total, up to >6A nominal output current can be sourced via the USB connectors. Since CompactPCI® Express type 2 peripheral slot cards are not equipped officially with the high current power connector XP1, only two +12V power pins are in use on the XJ4 connector normally (rated 1A max. each). In order to establish a higher current +12V power rail, the EB3-TONE can be populated with the power connector XP1, which would be mandatory for CompactPCI® Express type 1 peripheral slots. There are CompactPCI® Express backplanes available which have the complementary XJ1 also stuffed for type 2 slots. In a PXI Express™ system however, the XP1 power connector (if populated on the EB3-TONE) would collide with a CompactPCI® Classic P1 connector on hybrid backplane slots. For those applications the XP1 connector must not be stuffed on the EB3-TONE, and the total V_{BUS} current via the USB connectors should not exceed ~3A. Please identify your particular system environment before ordering the EB3-TONE with or w/o XP1.

CompactPCI® Express Backplane Connectors

The EB3-TONE is equipped with two connectors XJ3 and XJ4, which are mandatory for CompactPCI® Express type 2 and PXI Express™ peripheral slot cards, and the optional power connector XP1, which is specified for type 1 CompactPCI® Express peripheral slots. Please note, that XP1 must not be stuffed on the EB3-TONE for usage on PXI Express™ hybrid peripheral slots.


EB3-TONE • CompactPCI® Express - PXI Express • © EKF • ekf.com
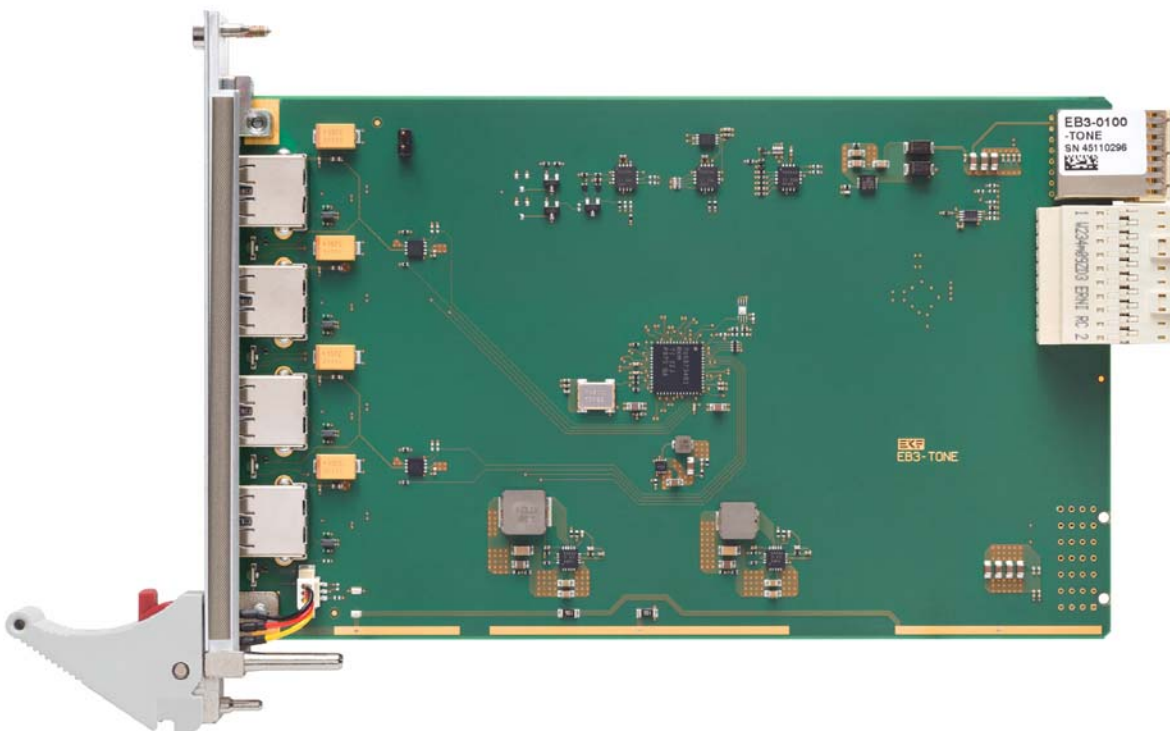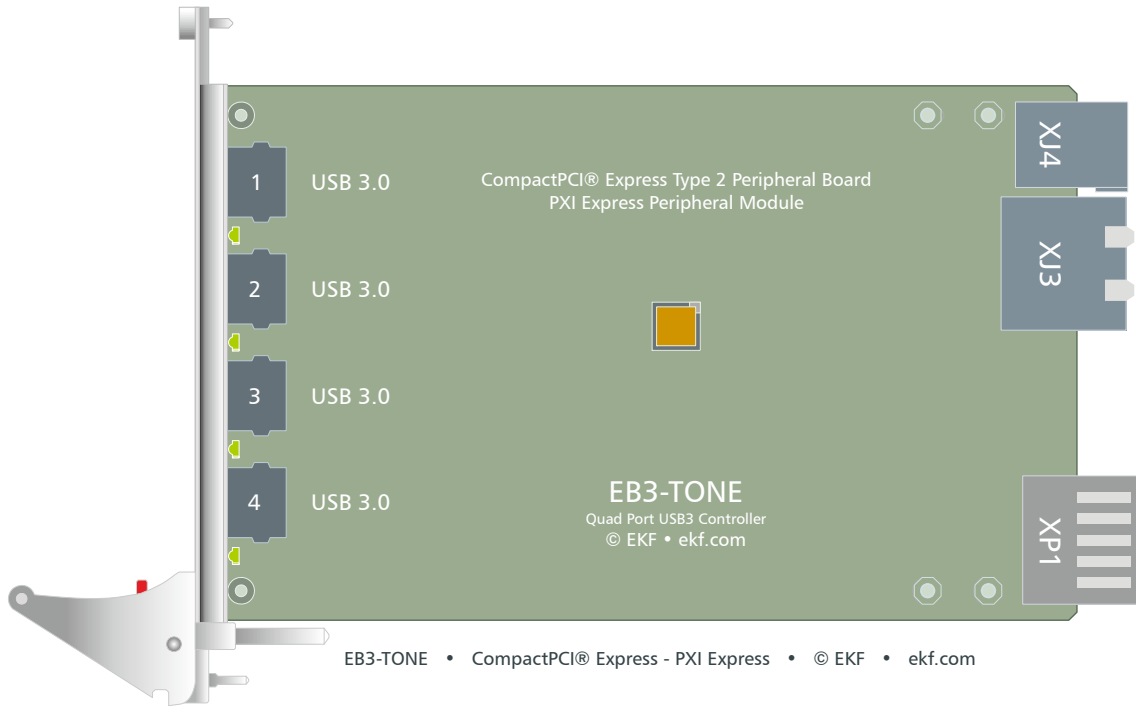
XP1

Universal Power Module (UPM) Connector EKF Part #264.06.007.10	
XP1	**Power Rail**
G	GND
F	+12V
E	+12V
D	GND
C	*+5V*
B	+3.3V
A	GND

pin positions printed grey are not connected

XP1 will be provided as an option. This is recommended in order to have available the maximum total V_{BUS} current supplied via the USB front panel connectors. However, XP1 may coincide with legacy type backplane connectors in a chosen PXI Express™ backplane slot. Please check your needs before ordering.
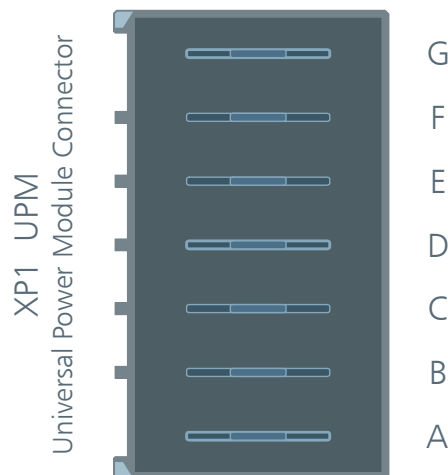
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XJ3

XJ3	A	B	C	D	E	F
Advanced Differential Fabric (ADF) Connector • EKF Part #250.2.0310.10.01						
1	RSV *PXIe_CLK100+*	RSV *PXIe_CLK100-*	RSV *PXIe_SYNC100+*	RSV *PXIe_SYNC100-*	RSV *PXIe_DSTARC+*	RSV *PXIe_DSTARC-*
2	PRSNT#	PWREN#	RSV *PCIe_DSTARB+*	RSV *PCIe_DSTARB-*	RSV *PCIe_DSTARA+*	RSV *PCIe_DSTARA-*
3	SMB_DAT	SMB_CLK	RSV	RSV	RSV	RSV
4	MPWRGD	PERST#	RSV	RSV	1REFCLK+	1REFCLK-
5	1PETP0	1PETN0	1PERP0	1PERN0	1PETP1	1PETN1
6	1PETP2	1PETN2	1PERP2	1PERN2	1PERP1	1PERN1
7	1PETP3	1PETN3	1PERP3	1PERN3	1PETP4	1PETN4
8	1PETP5	1PETN5	1PERP5	1PERN5	1PERP4	1PERN4
9	1PETP6	1PETN6	1PERP6	1PERN6	1PETP7	1PETN7
10	RSV	RSV	RSV	RSV	1PERP7	1PERN7

all signals printed grey are NC • *all signal names printed italic are specified for PXI Express™*
all differential pair shield pins ab(1-10), cd(1-10) and ef(1-10) are tied to GND

XJ2 / XJ3 ADF
Advanced Differential Fabric Connector
250.2.0310.10.01
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XJ4

XJ4	A	B	C	D	E
Enriched Hard-Metric (eHM) Connector • EKF Part #250.1.0508.10.02					
1	GA4	GA3	GA2	GA1	GA0
2	+5V_AUX	GND	SYSEN#	WAKE#	ALERT#
3	12V	12V	GND	GND	GND
4	GND	GND	3.3V	3.3V	3.3V
5	I/O *PXI_TRIG3*	I/O *PXI_TRIG4*	I/O *PXI_TRIG5*	I/O *PXI_GND*	I/O *PXI_TRIG6*
6	I/O *PXI_TRIG2*	I/O *PXI_GND*	ATNLED	I/O *PXI_STAR*	I/O *PXI_CLK10*
7	I/O *PXI_TRIG1*	I/O *PXI_TRIG0*	ATNSW#	I/O *PXI_GND*	I/O *PXI_TRIG7*
8	I/O *PXI_RSV*	I/O *PXI_GND*	I/O *PXI_RSV*	I/O *PXI_LBL6*	I/O *PXI_LBR6*

all signals printed grey are NC • *all signal names printed italic are specified for PXI Express™*

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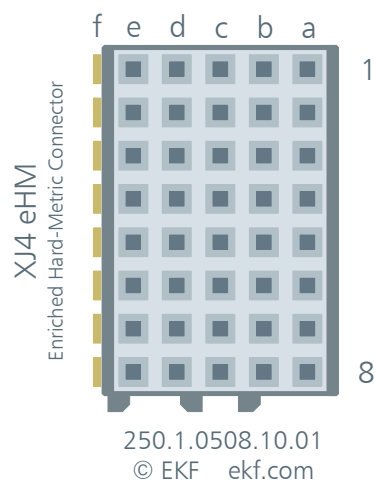
The XJ4 connector is mechanically coded either for pure usage with CompactPCI® Express (F1 key) or PXI Express™ (F2 key). By default, the F2 connector is populated, since it can be inserted into both types of backplane connectors XP4. Illustrated above is the F1 keyed connector.
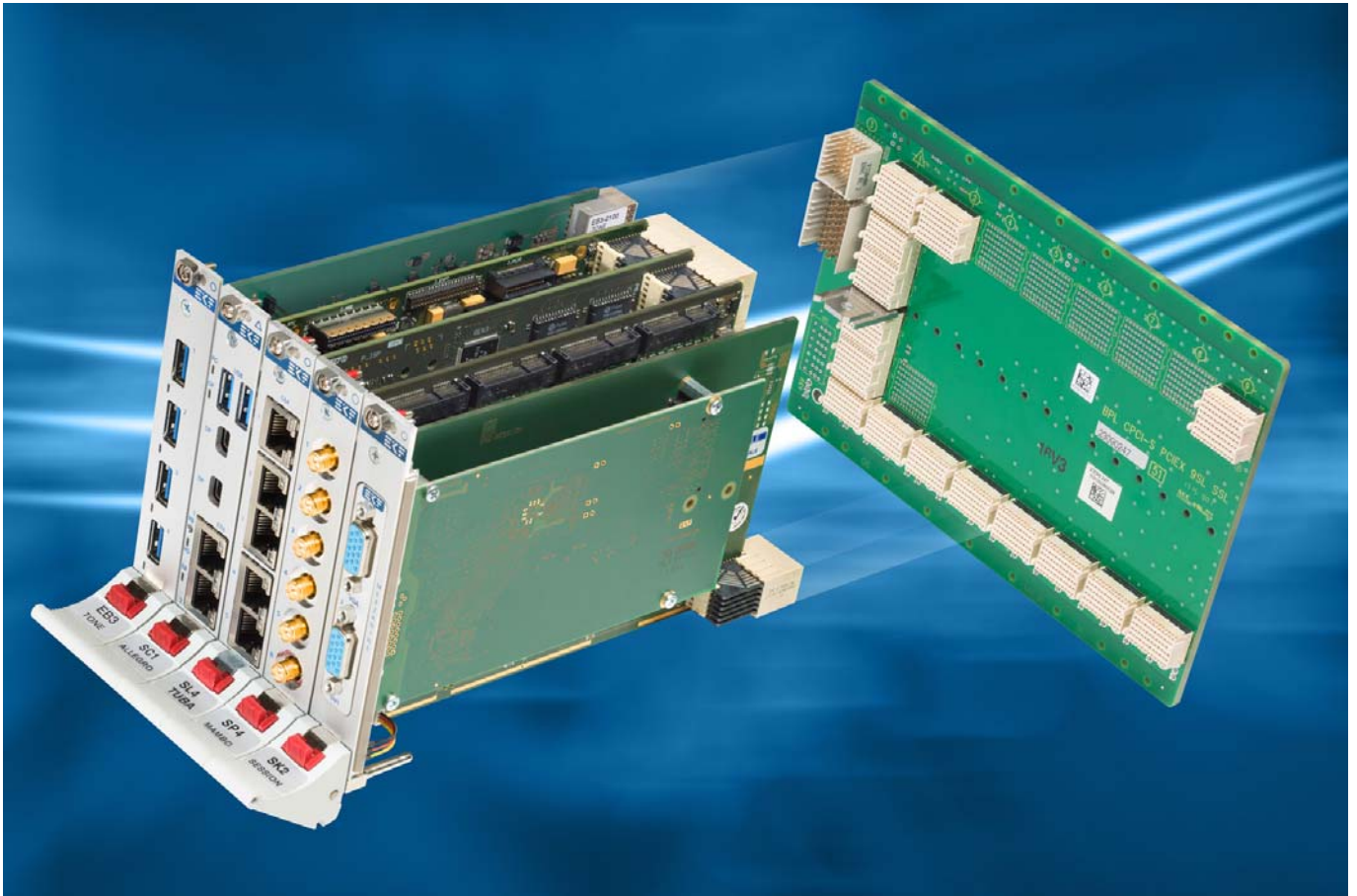
EB3-TONE in a Hybrid Backplane System

EB3-TONE Links	
EB3-TONE Home	www.ekf.com/e/eb3/eb3.html

Driver Software	
USB 3.0 TUSB7340 xHCI Driver	www.ti.com/product/tusb7340#toolssoftware

Ordering Information
For popular EB3-TONE SKUs please refer to www.ekf.com/liste/liste_23.html#EB3

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