

# AXIe Dual XMC Adapter



Adapts 2 PCIe XMCs to AXI Express with P16 High Speed Communications Ports and Digital IO

V1.01

## FEATURES

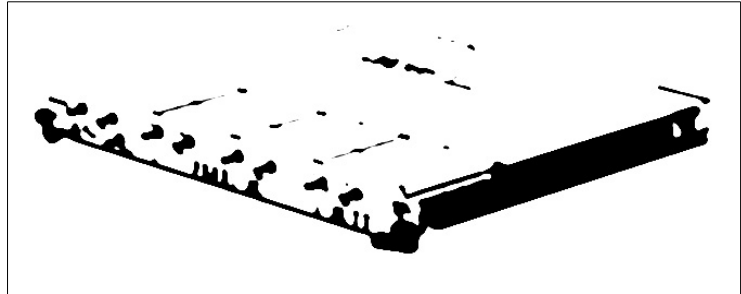
- Adapt one or two XMC PCI Express VITA 42.3 modules to an AXI Express slot
- Supports PCIe gen3: up to 8 lanes to each XMC Module; up to 16 lanes from AXIe backplane
- Transparent PCIe bridge operation
- Eight high speed gigabit transceivers (GTH lanes) from each XMC P16 exposed to dual, front-panel QSFP connectors
- 4 differential pairs routed from each P16 to a high-speed, front panel Samtec connector
- IEEE 1384 XMC mechanicals
- 100W power provided to each module
- Robust Face Plate
- Thermal plane and conductive rails improve module cooling
- Consumes one AXIe slot
- Supports newest XMC cards including Innovative 5 GHz analog I/O, using the Kintex XCKU060/XCKU085 Ultrascale FPGA

## APPLICATIONS

- Add XMC modules to standard AXIe host systems
- System expansion using high speed serial links

## SOFTWARE

- No extra software required. Compatible with IPMI software for AXIe systems



## DESCRIPTION

The AXIe Dual XMC module adapter allows one or two standard 75 x 150mm PCIe XMC modules to be used in an AXI Express slot. The XMC modules must be VITA 42.3-compatible and each may support up to eight PCI Express lanes via J15. The adapter is completely transparent to PCI Express, so no drivers are required. All PCIe bus signals from the AXI Express host bus (up to 16 lanes) are connected through a PCIe switch to the two XMC sites. The AXIe adapter can be utilized with Innovative Integration XMC cards including our newest generation models which provide 5 GHz analog I/O and use the Kintex XCKU060/XCKU085 Ultrascale FPGA.

Eight, high-speed serial signals from each XMC P16 connector are routed to front-panel QSFP connectors for high speed signals at speeds up to 10 GHz. The connectors provide a simple way to "patch-panel" communications links between cards, ideal for beam steering and coprocessing applications.

The XMC P16 connector also routes differential matched-length pairs to a high-performance, front-panel Samtec connector. Special support for trigger and timing inputs to Innovative XMC modules is provided through their front-panel SMA/SMMC connectors or AXIe backplane differential signals.

Convective cooling of each XMC module is supported via an integrated heat spreader assembly whose fins are exposed to the chassis air stream.

The XMC module mounts securely to the adapter using standoffs and the face plate. The face plate supports standard XMC bezels and an EMI gasket.

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05/18/17

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# AXIe Dual XMC Adapter



This electronics assembly can be damaged by ESD. Innovative Integration recommends that all electronic assemblies and components circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

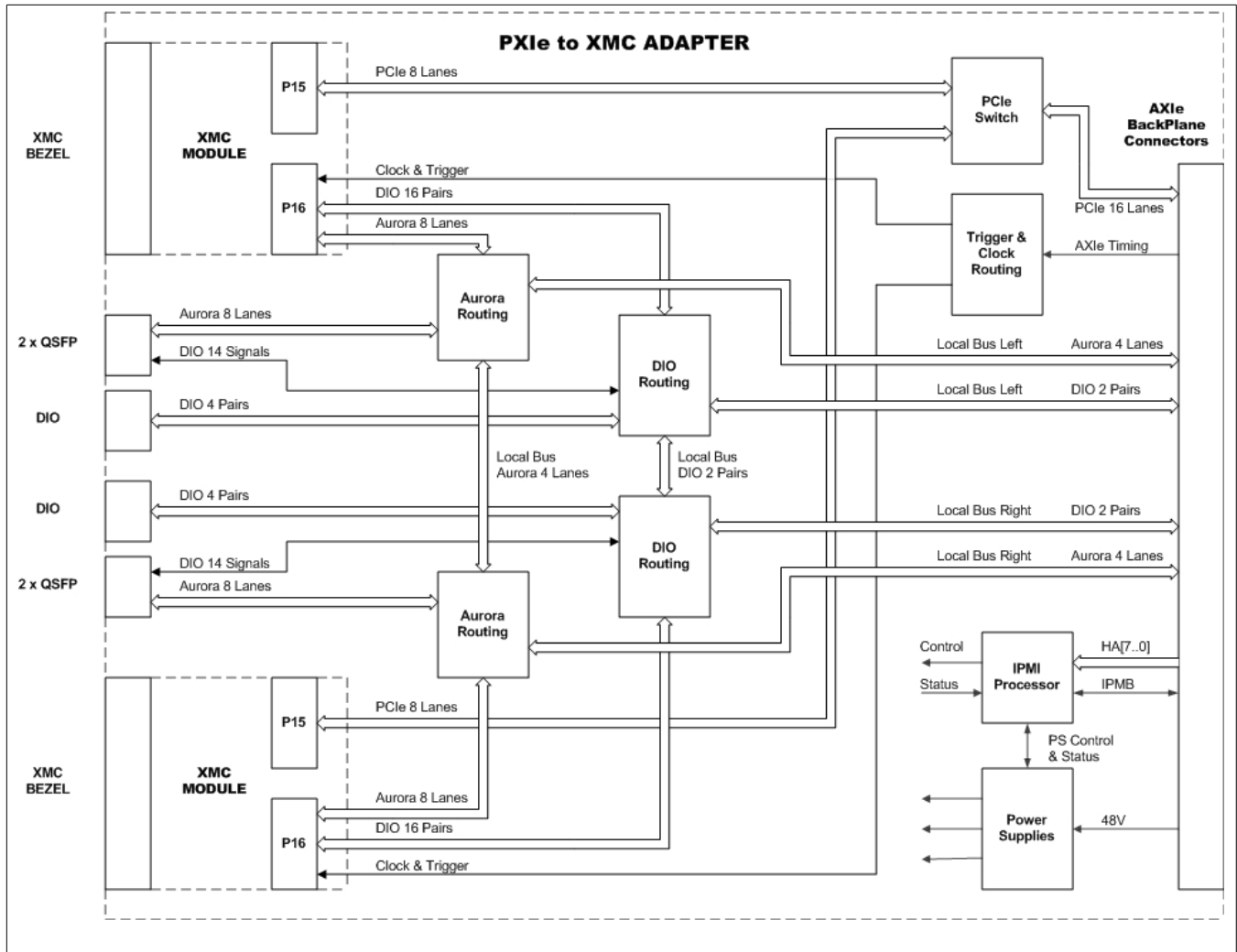
ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

## ORDERING INFORMATION

Product	Part Number	Description
AXIe-Dual XMC Adapter	80375-0	AXIe Dual XMC Adapter for Innovative X6, XA and XU-series XMC modules, single-height
DIO mezzanine module	80376-0	DIO mezzanine module for Innovative X6, XA and XU XMC module

# AXIe Dual XMC Adapter

## Adapter Block Diagram



# AXIe Dual XMC Adapter

Physicals	
Form Factor	AXI Express 8U, one slot
Size	12.69 in x 11.02 in (PCB)
Weight	500g

Power Capability Delivered to each XMC	
Volts	Amps
3.3V	7A Maximum (VITA 42.0 standard for XMC recommends 4A Maximum draw)
5V	Not provided to XMC
+12V	8.5A Maximum, to +12V & VPWR
-12V	Not provided to XMC

\*\* XMC cooling may be required

## J1 – Front Panel Connector for XMC DIO

DIO Signals are routed as 4 differential pairs. Pairs are 50 ohm, 100 ohm differential characteristic impedance, suitable for LVDS or LVPECL. These signals can also be used as single ended LVCMOS or LVTTTL according to the configuration of the XMC module.

Connector:

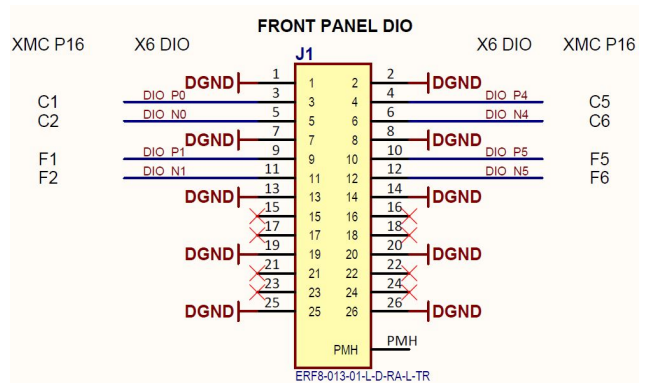
Samtec ERF8-013-01-L-D-RA-L-TR

Mating cables:

Samtec ERCD-013 series or equivalent (coax ribbon type for single ended signals)

Samtec ERDP-013 series or equivalent (twinax ribbon type for differential signals)

## DIO Signal Mapping for X6, XA, XU families

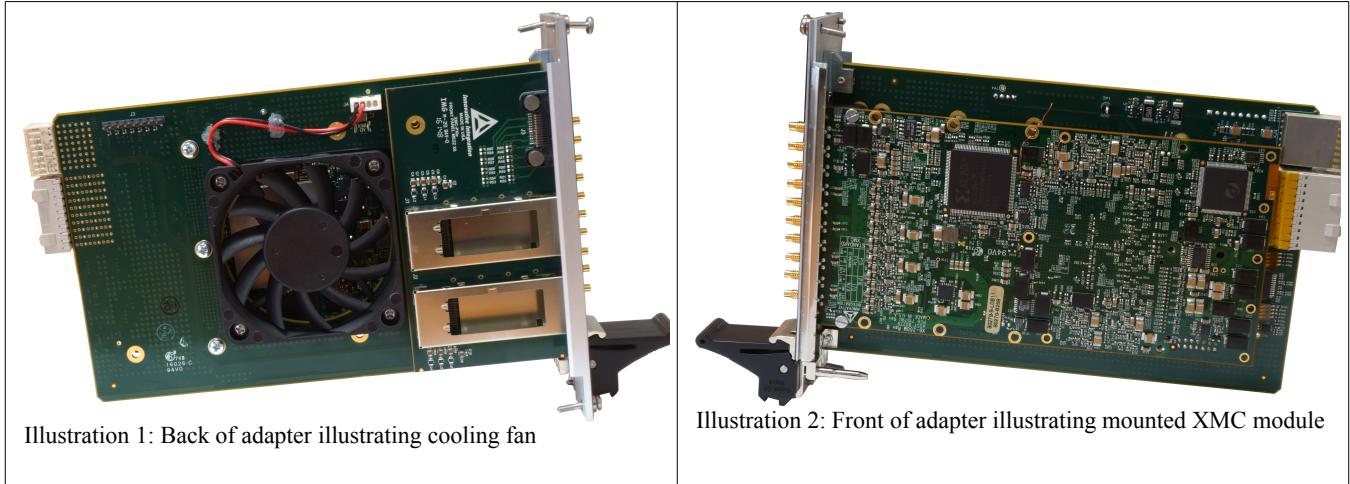


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## High Speed QSFP Connectors

XMC High Speed Serial Pair	XMC P16 Pins (P/N)	QSFP Connectors (0 and 1)
TXP0/N0	A1/B1	0: TXP0/N0
TXP1/N1	D1/E1	0: TXP1/N1
TXP2/N2	A3/B3	0: TXP2/N2
TXP3/N3	D3/E3	0: TXP3/N3
TXP4/N4	A5/B5	1: TXP0/N0
TXP5/N5	D5/E5	1: TXP1/N1
TXP6/N6	A7/B7	1: TXP2/N2
TXP7/N7	D7/E7	1: TXP3/N3
RXP0/N0	A11/B11	0: RXP0/N0
RXP1/N1	D11/E11	0: RXP1/N1
RXP2/N2	A13/B13	0: RXP2/N2
RXP3/N3	D13/E13	0: RXP3/N3
RXP4/N4	A15/B15	1: RXP0/N0
RXP5/N5	D15/E15	1: RXP1/N1
RXP6/N6	A17/B17	1: RXP2/N2
RXP7/N7	D17/E17	1: RXP3/N3

# AXIe Dual XMC Adapter



## Applications Information

### High Speed Serial Communications

The adapter card has 8 high speed serial lanes from the XMC card via P16 supporting Gigabit serial ports for intercard communications or expansion. The serial lanes connect to face plate QSFP connectors or to the backplane Local Bus. Standard QSFP cables can be used to connect multiple cards together to create high speed, dedicated communications channels between XMC modules. On Innovative's X5, X6 and XU modules, these are multi-gigabit ports directly from the XMC Virtex FPGA.

### Digital IO

Digital IO from XMC P16 is directly mapped to the face plate Samtec connector or to the backplane Local Bus. There are 4 differential pairs (100 ohm) with matched length. A mating cable suitable for high-speed differential pairs is available (see ordering information).

### Cooling the XMC Module

Many XMC modules require special considerations to provide adequate cooling. Monitor XMC module device temperatures and add/increase convective air flow if required to maintain within rated thermal limits.

The module provides conduction cooling using on-card heat sink and a dedicated thermal plane. The conduction cooling conforms to VITA20 specification for PMC/XMC module cooling. When a compatible module is used with the card, the thermal plane effectively conducts heat from the module to the carrier card and front bracket. System cooling is therefore more effective because of the heat spreading from the module to the carrier card.

# AXIe Dual XMC Adapter

## **Module Mounting Hardware**

The module can be securely mounted to the adapter for both conduction cooling and ruggedness. Two 10mm female threaded standoffs are used to secure the module to the adapter. If conduction cooling is used, cooling bars are secured to the card and the module using 2.5 mm screws. This hardware can be purchased from Innovative Integration.

## **Software Driver**

No extra software is required, other than standard IPMI software for AXIe systems.

# AXIe Dual XMC Adapter

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