

PCIe490

PCIexpress expansion chassis

User Manual



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1 Acronyms and related documents

1.1 Acronyms

FBGA	Fineline Ball Grid Array
FMC	FPGA Mezzanine Card
FPGA	Field Programmable Gate Array
JTAG	Join Test Action Group
LED	Light Emitting Diode
LVDS	Low Voltage Differential Signaling
MGT	Multi-Gigabit Transceiver
MSB	Most Significant Bit(s)
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
PCIe	PCI Express

Table 1: Glossary

1.2 Related Documents

- PCI Express Card Electromechanical Specification Revision 2.0
- PCI Express 225W/300W High Power Card Electromechanical Specification Revision 1.0

1.3 Requirements and handling instructions

- The PCIE490 must be equipped with boards compliant to the PCI Express Card Electromechanical Specification Revision 2.0
- Observe ESD precautions when handling the board to prevent electrostatic discharges.

2 Product Overview

The PCIe490 is a PCI Express (PCIe) expansion enclosure containing 8 x16 PCIe slots (4lanes connected per slot). The PCIe490 incorporates a PCIe expansion card which allows for a 16 lanes cable PCIe connection to a HOST computer. On the HOST computer side a x16 PCIe slot is required to plug the receiving PCIe expansion host card.

The PCIe490 is specially designed to operate multiple FPGA based PCIe boards like the 4DSP PC820 and PC821 boards. This system has the advantage of offering better control over cooling of the system, easily rack mounting of the system and separating FPGA and digitizer hardware from the HOST computer hardware. It can also be used to house other PCIe such as GPUs for high performance computing, storage adapters or networking equipment.

The following figure illustrates the PCIe490 system architecture.

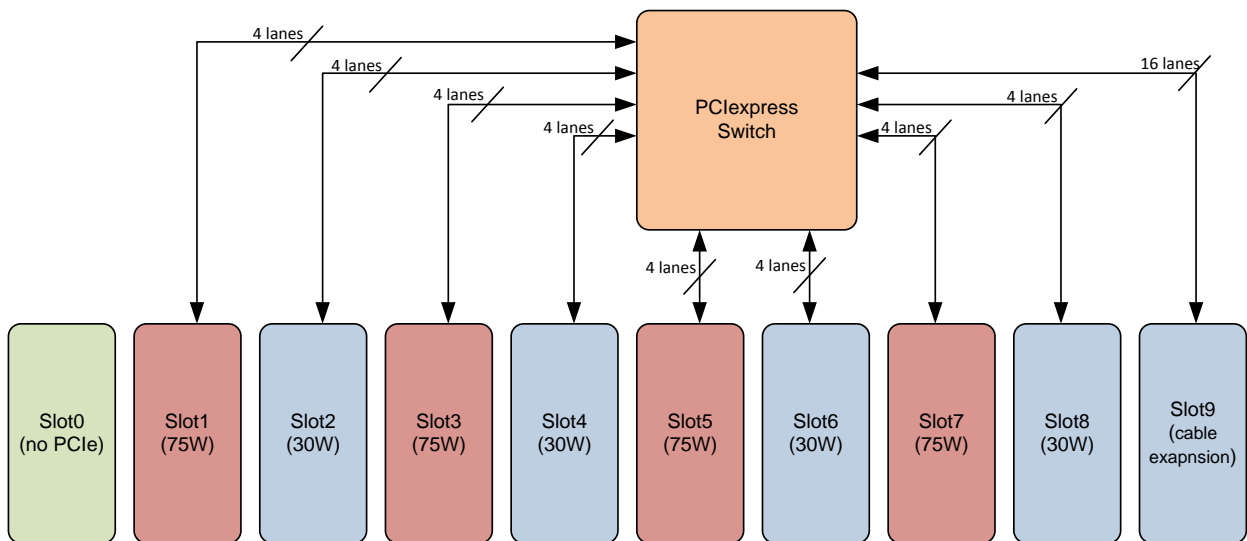


Figure 1:PCIe490 system architecture

2.1 Chassis Description

The PCIe490 is a 4U high 19 inch wide chassis offering 8 PCIe x16 expansion slots. Each expansion slot has a 4lanes PCIe generation 2 connections to the local PCIe switch. The chassis is equipped with fans located in the rear of the chassis for air cooling. The suck air into the chassis from the rear panel.

The system has a total of 10 front panel slots that can be used for front panel IO from cards plugged into the PCIe490. The slots are numbered from 0 to 9 and Figure 2 and Figure 3 show their respective locations.

Slot 0 does not have a PCIe expansion slot associated to it, it is only used in case the Card plugged into slot 1 requires additional front panel IO. This is the case if a PC821 card is plugged into slot 1 for example.

Slot 9 typically holds the 16 lanes PCIe expansion cable adapter card

Slots 1 through 8 are the PCIe expansion slots that can carry a PCIe compliant card. The slots 1,3,5 and 7 are able to support cards that consume upto 75 Watts, the other slots are designed to support cards that consume up to 30 Watts.

2.2 PCIe host card and

The standard configuration incorporates a 3 meters long x16 PCIe expansion cable with a x16 PCIe host card. The PCIe x16 host card has to be installed in the host computer system. The 16 lanes expansion cable is then connected between the two x16 PCIe host cards.

2.3 System overview



Figure 2: PCIe490 internal view



Figure 3: PCIe490 front view

3 Electrical specifications

Input power is 100-240VAC and is supplied through the IEC60320 C14 connector on the rear of the chassis. The power supply is rated for 750W. The following table shows the power supply specifications.

AC input	Voltage 100-240 Vac Frequency 50-60Hz Current max 12A @ 100Vac, max-6 A @ 240Vac
DC input	+3.3V, max. current 22A +5V, max. current 22A +3.3V and +5V, max. combined power 120W +12V, max. current 62A +12V, max. power 744W -12V, max. current 0.3A -12V, max. power 3.6W +5VSB, max. current 2.5A +5V, max. power 12.5W Combined peak power 750W

The power supply provides 4 auxiliary PCIe power connectors that can be used to source additional current to add-in cards that have high-power demands.

The nominal electrical load per power supply rail of the PCIE490 are shown in the table below.

Table 2: Nominal power consumption

Nominal (only PCIe expansion card installed)	+3.3V, current 200mA +5V, current 2.5A +12V1, no current +12V2, current 1.1A (cooling fans)
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The maximum electrical load per power supply rail per expansion slot is shown in table

Slot	Slot Rail	Supply rail	Max current per slot (A)
1-8	+3.3V	+3.3V	6A
1 and 3	+12V	+12V1	5.5A
2 and 4	+12V	+12V1	2.1A
5 and 7	+12V	+12V2	5.5A
6 and 8	+12V	+12V2	2.1A

The system can hold a maximum of 4 PC821 boards. Adhere to the following requirements when plugging a PC821 into the system:

- Place a PC821 only in slot 1,3,5 or 7
- Always connect the auxiliary power connector to the PC821

The system can hold a maximum of 8 PC820 boards. The PC820 can be plugged into all slots and requires the auxiliary power connector to be connected when fitted into slot 2, 4, 6 or 8.

4 Maintenance

Dust buildup should be removed from the grates covering the fans on the backside of the chassis on a monthly basis.

5 Environment

Environmental	Level A
Operating Temperature	5°C to 50°C
Storage Temperature	-10°C to 60°C
Humidity-Operating	< 90% non-condensing
Storage Humidity	0 to 100% non-condensing
Vibration Random	N/A
Shock	N/A

6 Ordering information

