

## PEX 8508 Key Features

- ◆ 8-lane PCI Express switch
- ◆ Up to five configurable ports (x1, x2, x4)
- ◆ Integrated SerDes
- ◆ Cut-through architecture with under 150 ns latency
- ◆ Quality-of-Service with up to 2 Virtual Channels/port
- ◆ Non-blocking switch fabric with full line rates
- ◆ Peer-to-peer switching and host-centric data transfer
- ◆ SHPC r1.1 compliant hot-plug controller on all ports
- ◆ Dual clock domains w/ SSC & Constant Frequency Clocking
- ◆ I<sup>2</sup>C interface for configuration
- ◆ 19x19 mm<sup>2</sup> PBGA package

## PEX 8508 Other Features

- ◆ Selectable Non-Transparent bridge port
- ◆ Compliant with PCIe base specification r1.1
- ◆ End-to-end CRC and Poison bit support
- ◆ Basic and Advanced error reporting
- ◆ Hardware fixed and Round Robin packet queue arbitration
- ◆ JTAG boundary scan
- ◆ Link power management states
- ◆ 256 byte payload size
- ◆ Lane and polarity reversal
- ◆ Configuration through host, I<sup>2</sup>C, or optional EEPROM
- ◆ JTAG Boundary Scan AC/DC
- ◆ System Error (SERR) Signal

## Application:

### *Data Acquisition Systems*

## PLX Product:

### *PEX 8508 – 8-Lane PCI Express Switch*

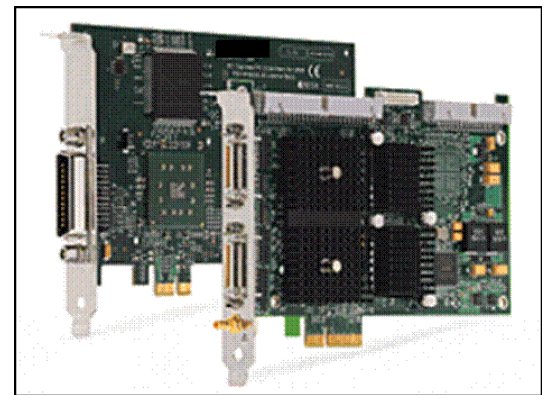
## Key Benefit:

### *High Bandwidth, Low Latency Port Fan-Out*

## Data Acquisition Systems Turning to PCIe

Historically, data acquisition (DAQ) systems used for test, storage, and analysis in industrial and control applications have utilized PCI, PXI, PCMCIA, USB, and Ethernet interfaces, among others. However, if one is requiring high bandwidth capability, PCI Express (PCIe) is the obvious choice. PCI Express greatly reduces the possibility of throughput bottlenecks which can easily occur when using legacy bus interfaces.

On a PCI-based system, the presence of a bandwidth-hungry device such as a Gigabit LAN card can monopolize the PCI bus. Since the PCI bus architecture requires the bus to share its bandwidth across each device on the bus, devices such as the Gigabit LAN card can hog all of the bandwidth while



**Figure 1. PCIe based Data Acquisition Cards**

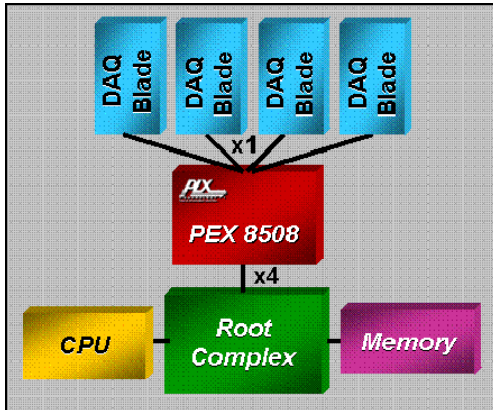
other data acquisition transactions run into a bottleneck. PCI Express, on the other hand, has a serial, point-to-point architecture where each device on the bus has a dedicated bandwidth.

Next generation DAQ systems are being designed to provide increased performance at a reduced cost as compared to traditional measurement instruments. PCI Express addresses both these concerns. Due to its high-bandwidth capabilities, PCI Express allows for high-performance data acquisition without running into throughput bottlenecks. Furthermore, because of its low pin count and highly scalable architecture, PCI Express solutions offer a much greater performance per dollar value when compared to other interfaces.

## Flexible & Versatile PCIe Switches

PLX offers a large selection of PCIe switches compliant with the latest PCIe specifications; validated in PLX labs; tested at the PCI-SIG plug-fest and by dozens of customers in their applications. Data acquisition system designers can cost-effectively expand the number of PCIe ports to accommodate a larger number of DAQ I/Os and maintain a high performance, low latency design using PLX PCIe switches.

The flexibility and versatility of the PLX switches allows designers to build to the needs of the application. The PEX 8508 offers flexible ports that can be configured in any legal width up to x4 while providing high-performance cut-through architecture (150 ns latency); hot-plug capability on every port; and quality of service (QoS) through two Virtual Channels (VCs). Figure 2 shows an example of a PCIe based Data Acquisition System.



**Figure 2. DAQ Host Chassis**

This example shows a DAQ system host chassis. In this example, the PEX 8508 is used for aggregation. Data coming in from all 4 DAQ blades is passed through the chip via x1 lanes. The PEX 8508 then pumps the data through to the Root Complex via a x4 lane.

Furthermore, each DAQ Blade will support a DAQ plug-in card. If this plug-in card is PCIe based, this is another possible fit for the PEX 8508. The PEX 8508 can be used to fan-out from the blade to other PCIe components within the DAQ plug-in card.

## Switches & Bridges Available Today!

PLX is shipping three PCIe bridges (PEX 8111, PEX 8114 and PEX 8311) and multiple PCIe switches as shown below.

Device	Lanes	Ports	Availability
PEX 8532	32	8	In Production
PEX 8524	24	6	In Production
PEX 8516	16	4/5	In Production
PEX 8518	16	5	Sampling Now
PEX 8508	8	5	Sampling Now

## More than just Fan-Out & Aggregation

- ◆ Cut-through architecture for high performance
- ◆ Two Virtual Channels for QoS

## Design Tools & Documentation:

[http://www.plxtech.com/products/pci\\_express/PEX8508/default.asp](http://www.plxtech.com/products/pci_express/PEX8508/default.asp)

Data Book, Design Notes, Product Brief  
HSPICE Model, BSDL Model

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