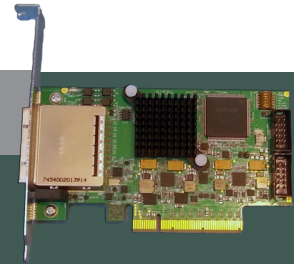# PXH810

PCI Express® Gen3 Host Adapter

Application developers seeking higher throughput and lower latency are increasingly looking at PCI Express for inter-system communication. Dolphin's PCI Express products provides an optimized PCI Express intercommunication platform for financial, industrial, medical, and military systems, utilizing standard, low cost PCI Express components. The PXH810 Gen3 PCI Express Host Adapter is our high performance cabled interface for distributed processor subsystems and I/O expansion applications. The host adapter extends PCI Express over cables to external systems. Based on PLX Gen3 PCI Express switch architecture, the PXH810 host adapter includes advanced features for non-transparent bridging (NTB) and clock isolation.

For high performance application developers, the PXH810 host adapter combines 64 Gbit/s performance with less than one microsecond latency, significantly improving overall inter-system communication. Inter-processor communication benefits from the high throughput and low latency.

The PXH810 performs both Remote Direct Memory Access (RDMA) and Programmed IO (PIO) transfers, effectively supporting both large and small data packets. RDMA transfers result in efficient larger packet transfers and processor off-load. PIO transfers optimize small packet transfers at the lowest latency. The combination of RDMA and PIO creates a highly potent data transfer system.

Dolphin's software suite takes advantage of PCI Express' RDMA and PIO data transfer scheme. Delivering a complete deployment environment for customized and standardized applications. The suite includes a Shared-Memory Cluster Interconnect (SISCI) API as well as a TCP/IP driver and SuperSockets software. The SISCI API is a robust and powerful shared memory programming environment. The optimized TCP/IP driver and SuperSockets™ software remove traditional networking bottlenecks, allowing standard IP and sockets applications to take advantage of the high performance PCI Express interconnect without modification. The overall framework is designed for rapid development of inter-processor communication systems.

With the implementation of clock isolation, the PXH810's signal quality is excellent. By isolating the system clock and transmitting an extremely low jitter high quality clock to downstream devices, the PXH810 offers users high signal quality and increased cable distances. The PXH810 supports PCI Express fiber optic cables up to 100 meters. These cables are x8 fiber optic cables. The improved signal quality and fiber optic support makes the PXH810 ideal for simulation systems. The PXH810 is also used in applications such as test and measurement equipment, medical equipment, and storage subsystem seeking high performance and data quality.

Features

- » PCI Express® 3 compliant - 8.0 Gbps per lane
- » Link compliant with Gen1, Gen2, and Gen3 PCI Express
- » PCI Express iPass Connectors
- » One x8 PCI Express port
- » RDMA support through PIO and DMA
- » Copper connection up to 2 meters, Fiber-optic cable connection up to 100 meters

- » Clock isolation support, CFC or SSC on cable
- » Transparent host and target operations along with non-transparent bridging to cabled PCI Express systems
- » Low Profile PCI Express form factor
- » EEPROM for custom system configuration
- » Link status LEDs through face plate
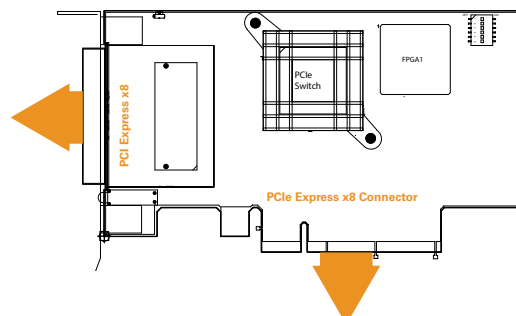
Product Deployment Applications

Host to host connections

When used for inter-host connections, the PXH810 adapter is capable of node to node connections or connections through a IXS600 Switch as shown in figure 1. Each connection supports 64 Gbps with latencies as low as .60 microseconds. Designed for x8 PCI Express Systems, the PXH810 supports any system with a standard x8 or x16 PCI Express slot. Gen3 operation requires a system that supports Gen3 PCI Express.

Figure 1: Eight node PXH810 cluster

Performance

The PXH810 adapter delivers higher through than Gen2 PCI Express adapters. This is demonstrated by using the SISCI API. This high performance API takes advantage of the PXH810 PCI Express® hardware performance to deliver over 6500 MB/s of real application data throughput for high performance communication. Figure 2 shows the throughput at various message sizes using Dolphin IXH610 Gen 2 adapter and PXH810 Gen 3 host adapters.
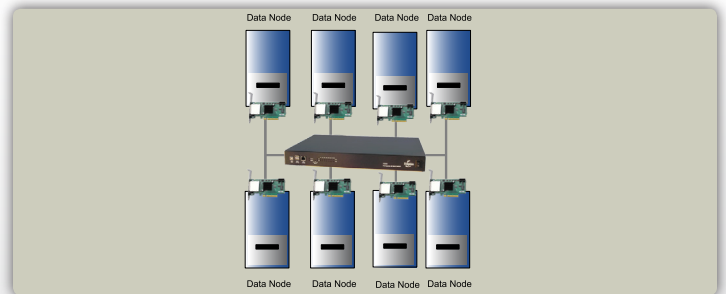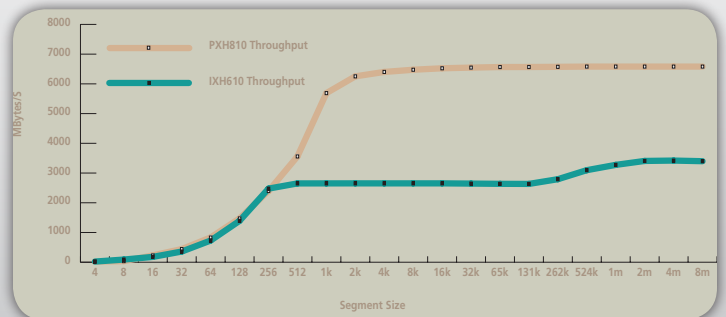

Figure 2: SISCI PIO/DMA Throughput

Specifications

Link Speeds	64 Gbit/s per port
Application Performance	0.54 microsecond latency (application to application)
Active Components	PLX PCI Express Switch
PCI Express®	Base Specification 3
Topologies	Switch/ point to point
Cable Connections	x8 iPass cable, fiber optic cable support
Power Consumption	10 watts
Mechanical Dimensions	Low profile - 68.90 mm (2.731 inches) x 120 mm (6.600 inches)
Operating Environment	Operating Temperature: 0℃ -55℃ Relative Humidity: 5% -95% non-condensing
Dolphin Software	SuperSockets™ Berkley Sockets API Microsoft WinSock2/LSP support Advanced TCP/IP driver SISCI API

Usage Modes	Host Target Non-transparent bridging
Regulatory	CE Mark FCC Class A UL94V-0 compliant RoHS Compliant
Configuration	Dip-switch configurable
Mounting Plates	Full height plate installed Half height plate included with board
Operating Systems	Windows RTX Linux VxWorks
Product Codes	PXH810 Host Adapter