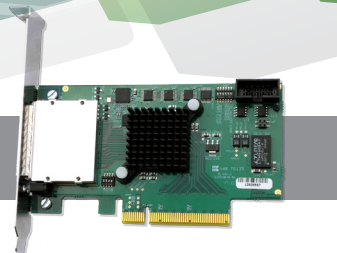# IXH610 PCIe Host Adapter

Gen2 PCIe Host Adapters

The IXH610 Gen2 PCIe Host Adapter is a high performance cabled interface to external processor subsystems or I/O subsystems. Based on Gen2 PCI Express bridging architecture, the IXH610 host adapter includes advanced features such as non-transparent bridging (NTB) and clock isolation.

For high performance application developers, the IXH610 host adapter combines 40 Gb/s performance with less than one microsecond latency, significantly improving overall inter-system communication. Connecting remote I/O subsystems in transparent mode requires no special drivers, so deployment is fast and easy. Inter-processor communication also benefits from the high throughput and low latency.

The IXH610 performs both Direct Memory Access (DMA) and Programmed IO (PIO) transfers, effectively supporting both large and small data packets. DMA transfers result in efficient larger packet transfers and processor off-load. PIO transfers optimize small packet transfers at the lowest latency. The combination of DMA and PIO creates a highly potent data transfer system.

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

With the implementation of clock isolation, the IXH610's signal quality is excellent. By isolating the system clock and transmitting an extremely low jitter high quality clock to downstream devices, the IXH610 offers users high signal quality and increased cable distances. Signal quality is essential for applications such as test and measurement equipment, medical equipment, and storage subsystem seeking high performance and data quality.

This card includes a Dolphin eXpressWare™ license.

Features

- PCI Express 2.1 compliant - 5.0 Gb/s per lane
- x8 PCI Express port - 40 Gb/s
- Link compliant with Gen1 and Gen2 PCI Express
- Support Gen1, Gen2, and Gen3 PCIe Slots
- RDMA support through PIO and DMA
- PCI Express External Cabling Specification
- PCI Express x8 iPass Connectors
- Copper cables - up to 7 meters

- Clock isolation support
- Transparent bridging to cabled I/O devices
- Non-transparent bridging to cabled PCIe systems
- Low Profile PCIe form factor
- EEPROM for custom system configuration
- Link and status LEDs through face plate

Cluster connections

When used for clustered connections, the IXH610 adapter is capable of node to node connections or connections through a IXS600 Switch as shown in figure 18. Adding industrial systems is done by connecting to the IXH620 XMC adapter. Each connection supports 40 Gb/s with latencies as low as 0.74 microseconds. Designed for x8 PCIe Systems, the IXH610 supports any system with a standard x8 or x16 PCIe slot. The IXH631 uses MiniSAS HD connectors to create up to a 5 node cluster without a switch.
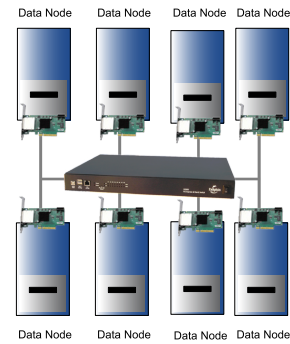
Figure 18: Eight node PCI Express Cluster

Remote I/O Connections

The IXH610 functions as a high quality transparent connection to remote PCIe I/O subsystems. These subsystems include test equipment, I/O expansion systems, specialized equipment, and storage systems. The IXH610 is specially designed for higher signal quality and support for spread spectrum clocking. The IXH611 is used as a target adapter in I/O expansion applications.

Figure 19: I/O expansion with PCI Express

Specifications

Link Speeds	40 Gb/s
Application Performance	0.74 ms latency (application to application) 3,500 MB/s Throughput
PCI Express	Base Specification 2.1
Topologies	Point to point, Switched
Cable Connections	x8 iPass copper cable support Supports x8 to x4 transition cables
Power Consumption	7 watts
Mechanical Dimensions	PCI Express Card Electromechanical Specification 2.0
Operating Environment	Operating Temperature: -10°C -60°C Relative Humidity: 5% -95% non-condensing
Dolphin Software	SuperSockets Berkeley Sockets API Microsoft WinSock2/LSP support SISCI API IPoPCIe

User Configuration Modes	Transparent Host Target adapter Non-transparent Host(NTB)
Regulatory	CE Mark EN 55022,EN 55024-A1&A2, EN 61000-6-2 FCC Class A UL94V-0 compliant RoHS Compliant
Operating Systems supported	Windows Linux VxWorks RTX
Product Codes	IXH610 - Host / NTB Adapter IXH611 - Host/Target Adapter IXH614 - 104Mhz Overclocked Host Adapter IXH631 MiniSAS HD Host Adapter