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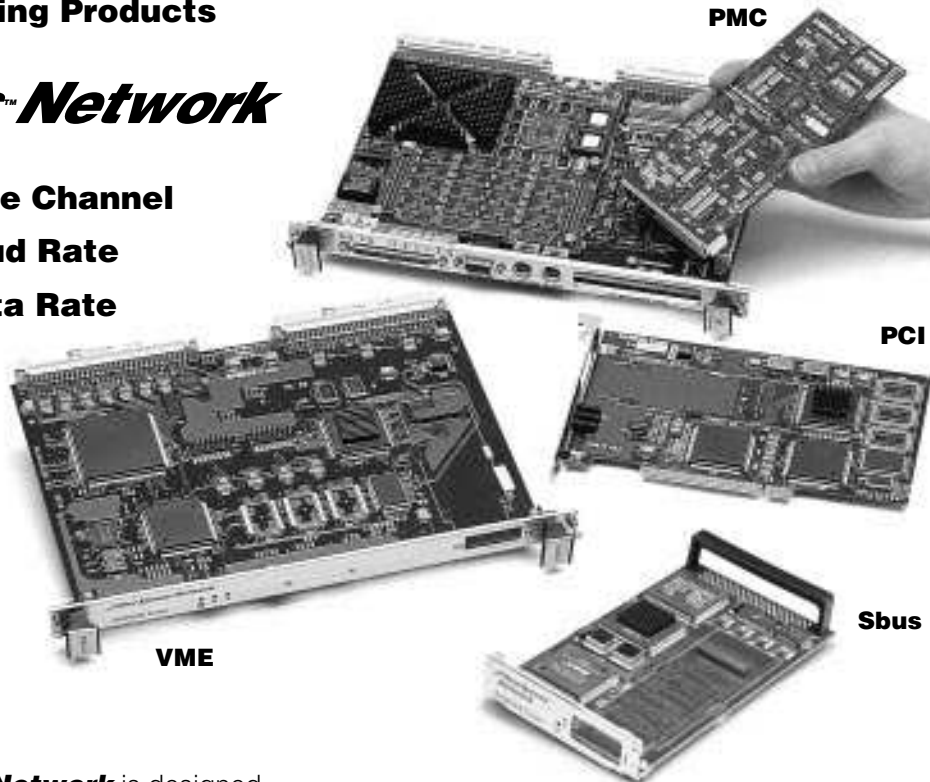
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Short Form Catalog

Family of Networking Products

FibreXpress™ Network

- **ANSI Standard Fibre Channel**
- **1.062 Gbit/sec. Baud Rate**
- **100 MByte/sec. Data Rate**
- **Class 1, 2, and 3 Services**
- **Arbitrated Loop, Switched Fabric, and Point-to-Point Topologies**



Introduction

Systran Corp.'s **FibreXpress Network** is designed to maximize the superior communication and interconnect capabilities of ANSI standard Fibre Channel. This makes FibreXpress the right choice for all types of clustering, networking, and mass storage applications demanding high-throughput, low-latency, real-time data transfers.

Combining the delivery and repeatability of a channel with the connectivity and protocol multiplexing of a network, Fibre Channel delivers the high-speed data transfers and interconnect versatility required by today's – and tomorrow's – data-intensive applications:

- Digital signal processing*
- Particle physics*
- High-speed data acquisition*
- Medical imaging*
- Network backbones*
- Workstation clustering*
- Video production*
- Simulation systems*
- Range and telemetry systems*

Advanced Architecture

Systran's FibreXpress Host Bus Adapter (HBA) design enables ultra-efficient interaction among the adapter's host interface, SRAM buffer, and intelligent Fibre Channel ASIC. The host interface includes both

memory-mapped and multi-channel DMA access to the SRAM buffer and provides either polling or interrupt event notification. The on-board SRAM buffer is available in either 128 KB or 512 KB.

The intelligent Fibre Channel ASIC features hardware assists for both IP and SCSI FCP protocols and sophisticated queue management capabilities. As a result, sustained throughputs of over 50 MBytes/sec. can be achieved, limited only by the maximum speed of the host system.

Host Bus and Network Media

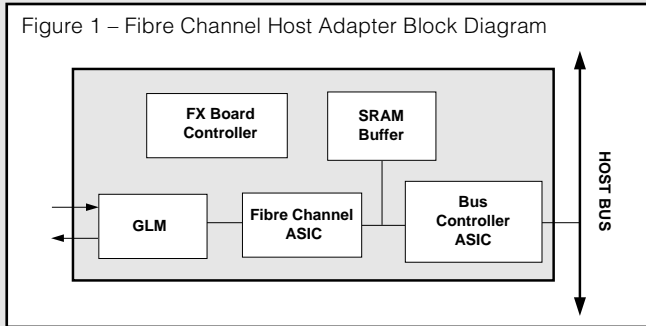
FibreXpress HBAs are available for all popular bus architectures, including PCI, PMC, VME64, and SBus, providing maximum flexibility in the selection of computer hardware. All HBAs are single-slot designs that minimize demands on precious backplane resources. All HBAs (except PMC) support direct interface to copper and optical cables through the industry standard 80-pin Gigabit Link Module (GLM). Two PMC versions are available with built-in network media support for copper and 850 nm optics, at 1.062 Gbit/sec. speed.

Fibre Channel truly is the "next generation" in high-performance system interconnects...and Systran's FibreXpress Network is your link to bringing the power of Fibre Channel to **your application!**



How FibreXpress Works

Figure 1 – Fibre Channel Host Adapter Block Diagram



When transmitting data to the network, the Fibre Channel host adapter receives data from its host computer across the bus into its SRAM buffer queue (Figure 1). Either the host writes to the adapter's SRAM (the adapter operates as a bus slave), or the adapter's DMA engine moves the data to the adapter's SRAM (the adapter becomes a master for the bus). As the transfer progresses, the host modifies the transmit queue pointers. This signals the Fibre Channel ASIC to start a Fibre Channel transaction.

On receiving a "data to be sent" signal from the host, the ASIC reads SRAM buffer data, formats the data to fit the Fibre Channel standard, and sends the 8B/10B encoded data to the link module. The link module

converts all data received from the ASIC into the appropriate 8B/10B encode scheme for the transmission medium (fiber optic or coaxial) being used and transmits the data to the medium.

After completing the transaction, the ASIC notifies the host by updating the SRAM buffer data structures to create space for additional host CPU data and (optionally) asserting the hardware interrupt.

When receiving data from the network, the link module converts the media signal into a parallel, ASIC-usable form. The ASIC validates the reception, returns appropriate acknowledgments, and writes the Fibre Channel header and data to the SRAM buffer queues.

After reception of one or a series of frames, an interrupt from the adapter informs the host of the data reception (the ASIC detects and collects out-of-order frames within a sequence). The host then moves the data from the SRAM buffer either by a simple read or by using the adapter DMA engine.

Once data are removed from the SRAM, the space is returned to the ASIC for future Fibre Channel data reception. Bi-directional transfers across the bus and through the Fibre Channel adapter board can be performed concurrently.

Specifications

ANSI Fibre Channel Standard:

FC-PH Revision 4.3
FC-AL Revision 4.3

Fibre Channel Topologies:

Point-to-Point
Switched Fabric
Arbitrated Loop

Electrical Requirements:

+5 VDC, 1.6 Amp. (typ.)

Operating Temperature:

0° to 50° C (32° to 122° F)

Storage Temperature:

-40° to +70° C (-40° to 158° F)

Operating Humidity:

5% to 95% (non-condensing)

Copper:

Data Rate: 1062.1 Mbit/sec.
Cable: Twinax
Connector: 9-pin D-SUB (GLM)
dual 1 x 3 differential (PMC)
Distance: 30 meters (D-Sub Duplex Cable)
10 meters (1 x 3 differential
Simplex Cable)

Shortwave Laser:

Wavelength: 850 nm
Data Rate: 1062.1 Mbit/sec.
Cable: 50/125 µm MM fiber
Connector: dual SC
Distance: 300 m (1062.1 Mb)

Longwave Laser:

Wavelength: 1300 nm
Data Rate: 1062.1 Mbit/sec.
Cable: 9/125 µm SM fiber
Connector: dual SC
Distance: 10 km

FibreXpress Network Product Line

Software Drivers

Two FibreXpress protocol drivers are available: the Direct Attach Disk Device Driver (FCDA) and the FibreXpress Lightweight Protocol Device Driver (FXLP).



FCDA is a Fibre Channel Association profiled device driver assuring interoperability with other Fibre Channel products. The driver is designed for private-loop, mass-storage SCSI communication. With the FCDA device driver, FibreXpress host bus adapters interface directly to mass-storage devices, providing performance characteristics not found in any other mass storage interface. Applications generally access the disk through the OS file system. However, under some real-time operating systems, the application may link directly to the driver to improve performance.

FXLP was designed for computer-to-computer communication in data-intensive image processing applications. It allows an application to be linked directly to the device driver, bypassing the TCP-IP protocol stack to achieve high-throughput, low-latency data communication that cannot be achieved with TCP-IP. FXLP loosely follows the sockets paradigm which allows an application to set up a virtual channel to a specific destination, then send and receive data.

Network Transparent Switch *Patent Pending*

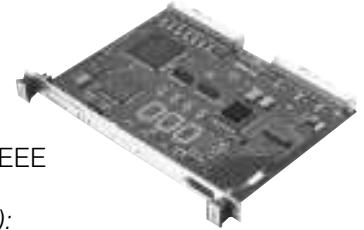
Systran's Network Transparent Switch (NTS) is a multi-purpose, 32-port I/O switch designed to route and switch 1.0625 Gb/s signals. The NTS supports Loop and Multicast topologies, making it capable of simultaneous Fibre Channel Arbitrated Loop and Point-To-Point connections. The NTS port cards are available which support 1.062 Gb/s optical and copper signals.

In order to simplify installation, the NTS is designed to self-configure on power-up. It also supports port isolation in the event of signal loss, providing reliable Fibre Channel Arbitrated Loop operation even in the event of node failure. Contact your Regional Sales Manager for details on the available configurations.

VME 6U/9U

Hardware Compatibility:
VMEbus Rev. C.3, ANSI/IEEE
Standard 1014-1987

Physical Dimensions (6U):
9.187" x 6.299" (233.000 mm x 160.000 mm)



PCI

Hardware Compatibility:
PCI Specification
Version 2.1

Physical Dimensions:
4.200" x 7.000" (106.680 mm x 177.800 mm)



PMC

Hardware Compatibility:
PMC IEEE P1386.1/Draft 2.0
PCI Local Bus Specification Version 2.1,
and CMC IEEE P1386/Draft 2.0

Physical Dimensions:
2.915" x 5.866" (74.041 mm x 148.996 mm)



Sbus

Hardware Compatibility:
Sbus Specification IEEE
Standard 1496-1993

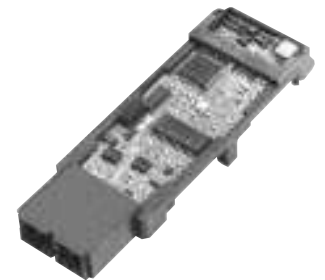
Physical Dimensions:
3.299" x 5.825" (83.795 mm x 147.955 mm)



Gigabit Link Modules (GLM)

FibreXpress GLMs provide flexible support for a variety of speed and media options.

FibreXpress options include copper, shortwave laser, or longwave laser at 1.062 Gbit/sec. Other standard GLMs may be used.



Product Specifications are subject to change without notice.

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Doc. F-T-SH-FCSFCTLG-A-0-B2(10/9/96) (10M)



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