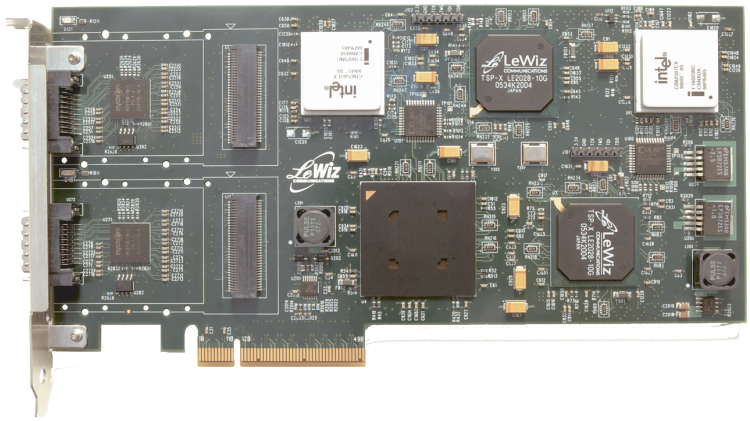
DATASHEET **TALON3220** ™

LeWiz COMMUNICATIONS



Dual port, 10 GigE, CX-4 Copper/ Fiber Optical NIC, Dual TOE Engine, PCI-Express

Raising 10Gbps NIC performance to another notch, LeWiz's Talon3220 NIC offers 2, 10Gbps Ethernet ports on a single high-performance, 8 lane PCI-Express (PCI-E) bus slot. Taking advantage of LeWiz's advanced TCP/IP offload engine (TOE) architecture, the Talon3220 NIC provides TCP/IP acceleration as an option on the card. IT professionals can use the card in the familiar NIC mode or in the high performance TOE mode to achieve highest bit rate and lower system CPU utilization. LeWiz's Talon3220 card is designed specifically for servers, storage, and high-end client systems with PCI-E bus slots. The card is available for both the low-cost CX-4 copper or long distance fiber-optic network medium. A range of network distance from 15 meter to 40 kilometer can be implemented with the Talon3220.

In the NIC mode, LeWiz's 10GigE Talon3220 NIC can operate in a wide range of operating system environments from Windows to Linux. It simply works everywhere from desktop clients to data-center servers and storage systems. In the full TOE offload mode, the same NIC can operate in the Linux environment with low CPU utilization and higher speed capability, thus optimizes the efficiency of the system and the network environment.

The dual port 10GigE PCI-E is ideal for storage systems that require mirroring or backup function. One port can be connected to the storage-server connection and the other can be connected to the mirror or the backup system. Using only 1 card and 1 PCI-E slot saves system cost, reduces heat and at the same time makes use of the high performance PCI-E bus. The dual port can also be bonded to form a 20Gbps pipe offering a network throughput that would satisfy the bandwidth appetite of any system in the market.

The Talon3220 utilizes chips that have been in full production, making the products highly reliable, readily available and low risk for users. The chips used on the board have many high-performance and advanced networking features making it useful in a wide range of networks from the LAN to the WAN environments.

Software devices drivers are also available for various operating systems: WindowsXP, WindowServer2003, Redhat Enterprise Linux, SUSE Enterprise Linux, and Fedora Core.

Linux with 32-bit or 64-bit option. All device drivers are loadable - a unique feature of LeWiz's TOE architecture. No need for users to recompile the system OS - easier to use.

Benefits

- Lowers overall network cost
  - Increases throughput and load handling for systems
  - Delay new purchase hardware and software
  - Better reliability, less downtime
- Enhances and balances system performance
  - 256K concurrent connections
  - Allows processor to run applications efficiently
- Enhances system security
- Reduces network maintenance and service cost
- Non-intrusive to system hardware and software
- Easy installation

Microsoft Windows

Variety of flavors of Windows & Linux

Features

- Performs TCP/IP functions in hardware, not software, for lowest latency and overhead
- Handles MACs directly without CPU intervention
- Full TCP/IP offload
- Supports fail-over protection (alternate pathing)
- On chip DMA engine for high speed data throughput
- Full remote diagnostics capability
- Qualified across multiple host platforms from Dell™, HP™, IBM™, and others
- Supports all CPU types: Opteron™, Pentium™, Xeon™, PowerPC™, SPARC™, MIPS™, and others

Applications

- Servers (application servers, Web/DNS/e-mail/file servers, etc.)
- Storage (iSCSI, SAN/NAS, etc.)
- iSCSI NIC, initiator or target
- Security appliances (firewalls, load balancers, etc.)
- Network appliances
- Compression systems
- Streaming Multimedia

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System Interface	
Compliant PCI-Express Base Specification 1.1	
8 lanes PCI-express (PCI-E)	x8 lanes physical but also works in x1, x4, and x8 connector
Each lane capable of 2.5Gbps, full duplex	High lane Speed
Supports message signal interrupt (MSI)	
Supports 1 Virtual Channel	
Supports PCI-E advanced error logging	
Supports CRC checking and generation	Enhance data integrity, system reliability
Data loading from Serial EEPROM	Useful for OEMs requiring customized configurable product information
Each MAC has its own PCI-E register set	Host system can control and examine each MAC independently

External Network Interfaces	
Each Talon3220 board has 2 external Ethernet network interfaces. Dependent on the order code the board is configured for either copper or specific fiber optic type	
Dual Ethernet 10Gbps Ethernet port per board	Great for storage back-up, dat mirroring, or multi-zone networking using 1 board and 1 system PCI-E slots

15 meter CX-4 Copper (applicable to Talon3220-CX4 product only)	
Standard CX-4 copper connection (1 for each port, 10GBase-CX4, IEEE 802.3ak compliant)	Low cost NIC, cable and external switching equipments. Applicable to Talon3220-CX4 product only
Cable of 15 meter distance minimum for standard quality CX-4 copper cable	Great for systems to system interconnect such as server to storage system
300 meter 10GBase-SR 850nm Fiber Optic (applicable to Talon3220-SR product only)	
IEEE 802.3ae 10GBase-SR	Great for long distance deployment such as metro area network (MAN) or inter campus deployment
850nm fiber optic, multi-mode	
300 meter distance	
Standard LC-UPC optical connector type	
10Km 10GBase-LR 1310nm Fiber Optic (applicable to Talon3220-LR product only)	
IEEE 802.3ae 10GBase-LR compliant	Great for long distance deployment such as metro area network (MAN) or inter campus deployment
1310nm fiber optic, single mode	
10Km distance	
Standard SC-UPC optical connector type	

Networking Features	
Flow control 802.3x	Compliant to standard networking
802.1q VLANS	Supports virtual networking concepts Adding VLAN tags on transmit Removal of VLAN tags on receiving Packet filtering based on VLAN tags
802.1p QoS	Supports prioritization of network traffic (NIC mode only)
Port fail-over capability	Networking redundancy to enhance network system reliability - continue network operating even during network down time.
Port bonding (or port teaming)	Achieve 2 times the throughput rate. Treating 2 ports as 1 great big pipe for data transfer

Software Support	
Loadable driver for both Windows and Linux	No need to recompile the driver or the OS
User friendly NIC mode	NIC mode is familiar to many IT professionals
Full TCP/IP offload mode	Linux environment only. Offers full TCP/IP acceleration for best bit rate and low CPU overhead
None interference with existing applications	Existing software applications would run as is without modification or recompiling
Windows 2000	NIC mode only, partial offload acceleration
Windows Server2003	NIC mode only, partial offload acceleration
Windows XP	NIC mode only, partial offload acceleration
Redhat Linux AS 4.0	Full offload acceleration, both 64 and 32 bit version
Redhat Linux ES 4	Full offload acceleration, both 64 and 32 bit version
Novell SuSE LES 9.0	Full offload acceleration, both 64 and 32 bit version
Novell SuSE Professional 9.3	Full offload acceleration, both 64 and 32 bit version
Fedora Core 4	Full offload acceleration, both 64 and 32 bit version
Fedora Core 3	Full offload acceleration, both 64 and 32 bit version
IPv4 and IPv6	Fully compatible with IPv4 and IPv6

Physical Size	
Width	4.2 inches
Length	8.4 inches

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Offload and High Performance Features

General High Performance Features

Each Ethernet port has a dedicated MAC with its own register set, memory buffers, DMA engines	Optimize for high performance with independent transmit and receive simultaneously on a per port basis
Each Ethernet port has an optional dedicated TCP/IP offload engine with its own memory buffers, DMA and data processing engines	Full TCP/IP offload is available for Linux devices drivers only. Other offload features are available in both Windows and Linux OS
TCP/UDP segmentation, or large send offload	Device drivers automatically uses this feature for high performance
TCP/UDP checksum offload	Free the CPU from performing checksum functions on a packet to packet basis
Statistic collection for management and RMON on a per Ethernet port basis	Useful for diagnostic and performance optimization of the network
Independent DMA engines for transmit and receive	Mitigating instantaneous recieve bandwidth and eliminating transmit underruns. Optimize the 10Gbps bandwidth efficiency in the network
Dedicated DMA engines for fetching transmit transmit and receieve descriptors	Maximizes the host bus bandwidth
Supports reception and transmission of packets with length up to 16Kbytes	Maximizes the efficiency of the 10Gbps network
256KBytes receive data FIFO buffer per Ethernet port	Large burst receive from the network. Maximizes the network efficiency
32KByte transmit data FIFP per Ethernet port	Large burst transmit to the network. Maximizes the network efficiency
Parity protection for each receive FIFO	Enhance system reliability
512 receive descriptions per Ethernet port	Optimize system CPU usage
128 transmit descriptions per Ethernet port	
Transmit interrupt delaying and reducing	
Dedicated on-board bus for each MAC	No arbitration overhead. Multiple on-board buses for high speed data transfer
High speed 8 lane PCI-express bus	System bus interface capable of 40Gbps
Jumbo frame support	Up to 16KByte frame size

Full TCP/IP offload feature

(In addtion to the above high performace features, with the Linux device driver, the Talon3220 board also supports the following on a per port basis)

TCP session set up and tear down	Handles SYN, FIN three way handshake and complete session setup, tear down w/o CPU intervention
TCP reassembly	Re-assembles segmented packets into ordered, non-redundant information w/o CPU intervention
256,000 concurrent session	High number of TCP sessions suitable for even large client base applications
Data re-transmission	Resends failed packets automatically w/o CPU intervention
Data re-ordering	Re-orders data packets received out of order & eliminates redundant data w/o CPU intervention
TCP Timer handling and management	Manage 7 TCP timers per TCP session without CPU intervention
TCP Option handling	Handling TCP protocol's TCP options such as TCP windows scaling updating w/o CPU intervention
TCP buffer management	Work with the OS to manage TCP buffer allocation and freeing

Operating Spec

Uses standard voltages and conforms to electrical characteristics of PCI-express connector	12V and 3.3V
Operating temperature	0 -55 degrees C
Operating humidity	85% at 55 degrees C
Power consumption	18.5W (with both CX-4 ports fully active)
Air Flow	1 meter/sec (minimum)

Recommended System Requirements

(The following is the minimum recommended system requirement. The board can work in many different environments including the configuration specified below. This is not a required environment for the board to function)

x86 or other CUPs with 1GHz speed, 32-bit or better	For example: Xeon, Operton, XScale, PowerPC, MIPS, or others
1GByte of system memory	
x8 PCI-express slot or better	Or at least a x4 PCI-express with x8 physical connector

Others

Expansion FLASH 512KByte per Ethernet port (optional)	Primarily useful for OEM customers only. Can act as a boot ROM or special purpose function code/data storage

Product Part Numbers

Talon3220-CX4	CX-4 Copper version
Talon3220-SR	850nm fiber optic version, multi-mode
Talon3220-LR	1310nm fiber optic version, single-mode, 10Km distance

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