



ACCELERATED Ultra Low Latency FIELD PROGRAMMABLE

8x10Gbps, 2x40G Ethernet
PCI-Express x8 FPGA card
(Options for 8x10G/1G ports)

LeWiz's iTrade™ family of network interface cards (NIC) designed specifically for ultra low latency applications. The cards are targeted for use in financial trading systems on the client trader side, exchange or trade service providers. The card can be programmed with FPGA firmware for trade execution, market data processing, risk compliance check, feed handler, ultra precision traffic timestamping, network traffic management and others. Low latency, high frequency traders, proprietary traders, bankers, brokerage or investment funds would benefit from LeWiz iTrade™ TOE NIC products – taking advantage of the nano-second level latency.

LeWiz provides free FPGA source code so users can implement their own custom application logic or use the card as-is with LeWiz provided applications. The card can be plugged into standard PC system PCI-express slot and perform financial trading applications. It contains flexible Ethernet interface for up to 8 10G (or 1G) ports (or 2x40G) with no external PHY device. The FPGA on board can be ordered with different FPGA chips (up to 2 million logic elements). Standard delivery for iTrade7240 board contains Xilinx Virtex 7 690, speed 3 device with full source code for FPGA design examples and software driver. Its speed 3 enables users to close timing easily.

LeWiz also provides a full range of IP cores for use in different financial applications, applicable for different exchanges from NASDAQ™, NYSE™, CME™, to international exchanges such as Eurex™, Bovespa™, ASX™, Shanghai. LeWiz supports complex trading protocols such as FIX™, FTD, TCP/IP, or users can trade at super speed using user defined trading protocol. In addition, LeWiz provides IP cores for:

- PCI-express Hardware and Software framework - ultra low latency, kernel by-pass, deterministic
- Ultra low latency 10G MAC
- On-board microprocessor (full C, C++ programming)
- Multi session, small foot print, zero software assist, Ultra low latency TCP/IP offload engine
- Multi session, small foot print, zero software assist, Ultra low latency UDP/IP offload engine
- FIX protocol Engine (Full capability)
- Multi processing
- NIC Network Protocol library (ARP, PING, IGMP, etc)
- Hash algorithm, Table look up
- Filters based on strings or binary
- Pattern Matching Engine – string or binary
- Timestamping, Statistic tracking
- Super Send Engine – protocol agnostic
- Packet generator – full wire rate, programmable inter-packet gap

The IP cores can be used with standard FPGA tools such as Xilinx Vivado tool, Verilog/VHDL simulator.

User application interfaces with LeWiz hardware directly using LeWiz hardware API's and TCP socket. The iTrade7240™ card comes with loadable device drivers for **Linux** (Fedora Core, CentOS, RedHat, SUSE) operating systems. No need for the users to recompile the driver or patching the kernel. Full debug support is included, fully accessible at user level with easy to use utilities.

See LeWiz's Talon, iDefend, and iStream NIC PCI-express products at: www.LeWiz.com

Detailed Specifications:

Product part number	
iTrade7240	1x10G, 2x10G, 4x10G 8x10G, 1x40G, 2x40G
FPGA Options:	Virtex 7 up to 2000T
System interface	
Compliant PCI-Express Gen 3	
8 lanes PCI-express (PCI-E)	8 lane PCI-E physical but also works in with x8 or x16 connectors
Supports PCI-E advanced error logging	
Supports ECRC checking and generation	Enhance data integrity, system reliability
Memory	
Up to 16GByte DDR3	DRAM
Up to 144MByte	QDRII+
Up to 250MByte	RLDRAM, LLDRAM
2x128Mbyte on board flash	User info + programming
Serial Ports	
USB serial	USB-UART bridge Connect to any standard terminal
Micro-USB programming	USB-JTAG programming (Full compatibility with Xilinx tools)
Software support	
Loadable driver for Linux	No need to recompile the driver or the OS
User level utilities	Easy to use for configuration or debug interface
Redhat Linux ES	64 and 32 bit version
Novell SuSE LES 10	64 and 32 bit version
Fedora Core CentOS	64 and 32 bit version
A variety of kernel/OS are supported	
Option for Windows OS	

External network interfaces	
40Gbps, 10Gbps Ethernet ports per board	QSFP+, SFP+
Timing Control	
Ultra precision clock	ppb accurate for timestamping
User clock injection	User supplied clock
GPS clock or pulse injection	Global clock reference
Programmable clocks	User programmable speed
Standard crystals	Wide range (40, 233MHz, etc)
LED - observability	
8 user LEDs (front panel)	Control directly by user
12 internal LEDs	User GPIO or status LEDs
Expansion	
Dual SODIMM connectors	General purpose, user config
User power supplies	On-board for user tapping
SR/LR Fiber optic	
10GBase-SR fiber optic	300m, 850nm multi-mode
10GBase-LR fiber optic	10Km, 1310nm single mode
Copper Cable: 1, 3, 5, 7 Meter	
QSFP+-to-4SFP+	
SFP+-to-SFP+	
Physical board size	
Length x Width (per ordering)	6.6 x 10 inches (full length)
Operating spec	
Uses standard voltages from PCI-express connector	12V
Or stand-alone power 12V	No system required
Option: Passive (no fan) or active heatsink	
Operating temperature	0 – 55°C
Operating humidity	85% at +55°C
Recommended system requirements (for example only)	
x86 or other CPUs with 1GHz speed, 32-bit or better	For example: Xeon, Opteron, others
1GByte of system memory	x8 PCI-express slot or better

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