

Myricom 10 Gigabit Ethernet Network Adapters

For Financial Trading using Linux or Windows

CSPI's Myricom® network adapters with DBL™ software enable extremely low latency financial transactions. In addition, these adapters include two unique features: hardware A/B arbitration and the ability to measure the “tick to trade” latency with single-digit, nanosecond accuracy.

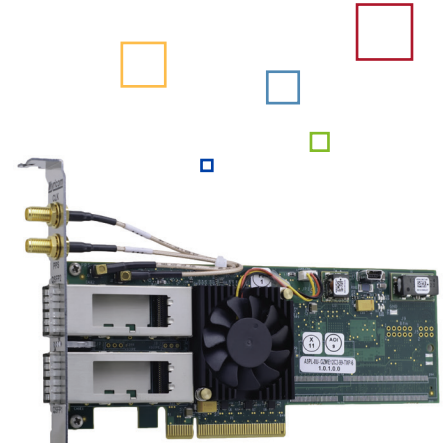
Hardware A/B Arbitration

Myricom adapters can arbitrate the A and B sides of multiple feeds for both fiber and microwave sources (4-way arbitration). The adapters ship with a configuration file defining how A/B is done for many popular equity and option feeds. Users can extend this file to define feeds that aren't available from CSPI. Offloading A/B arbitration with hardware reduces “tick to trade” latency further than competitive products can achieve. It also removes significant traffic from your servers' shared DRAM subsystems. Turning on A/B adds zero extra latency to the adapter's receive path.

Nanosecond Latency Measurements

Myricom 10GbE adapters can measure your application's latency with less effort and more accuracy than any expensive, packet capture device can achieve. All packets arriving at the adapter are timestamped. Moreover, Myricom adapters are unique in that they also timestamp packets as they leave the adapter, feeding those times back into your application. The on-card TCXO oscillator is extremely accurate but even greater accuracy can be obtained by attaching a higher resolution OCXO or rubidium atomic clock time source to the coax input provided.

Myricom products have been focused on low-latency networking since 1994. Myricom DBL™ software is the industry's original, and thus most mature, user-space TCP/UDP stack available today. Introduced in 2010, it has been in continuous operation by many financial organizations ever since. DBL offers both a socket-like API and a transparent acceleration mode (a replacement for the host's socket library). The transparent acceleration mode allows the customer to run his existing sockets application without modification. The optional API mode is optimized for lower latency and provides access to additional features.



KEY FEATURES

- 10GbE adapter that outperforms the competition at “tick to trade”, particularly when you exploit our hardware offload features
- A/B arbitration in hardware for up to 4 sources per feed (fiber and microwave arbitration)
- No dropped packets even during the busiest time of the trading day
- Industry's largest host buffers in case your application cannot keep up with surges in feed transaction rates
- Application “tick to trade” latency can be measured with single-digit nanosecond accuracy

Hardware Specifications

KEY SPECIFICATIONS

Bus Interface	PCI Express Gen 3, 8 lanes wide
Form Factor	Low-profile PCI Express x8 add-in card. Ships with a standard height faceplate installed; low profile faceplate in the box. The optional timing kit has a standard height faceplate with coax connectors installed.
Electrical Power	Adapter power consumption can change when firmware changes. 18.3 watts measured, using two ports and passive, copper cables with firmware BR5/RC3.
Environmental	CSPi recommends that adapters be installed into servers that provide some air flow over the PCIe slots (very common). Use in an office or computer room environment.
DBL Endpoints	Support for 8 simultaneous rings (DBL endpoints) per Ethernet port (16 or 32 rings per board). The size of each ring is limited by the amount of available host memory. Support for up to 512 simultaneous UDP multicast groups open per port (1024 or 2048 per board).
Latency	The preliminary, half round-trip time for a UDP ping-pong is 1.95 microseconds using 64 byte packets. The latency number was measured using the DBL API on a Haswell i7 platform (PCIe Gen 3). It includes the time needed to implement A/B because that time is always in the receive path, even when A/B is turned off.
On-board clock tick accuracy	±10 nanoseconds when measuring latency using the on-board TCXO. Use the optional timing inputs for ±3 nanosecond accuracy or extremely accurate measurements that combine data from multiple adapters. Refer to the timing kit datasheet for details.
IEEE 1588	Myricom time stamps are captured in a manner that allow IEEE-1588 software implementations to deliver highly accurate, synchronized time.
Passive Cable Length	Retimers, included on the adapter, support a 7 meter target specification. Not all passive cable specifications support this length. Using a QSFP to SFP+ adapter may also limit cable length.
Operating Systems	Support for all major Linux distributions as well as Windows 2008R2 and newer.
Virtualization	Myricom adapters are compatible with all popular virtual environments, provided that users assign the adapter to a single virtual machine. The alternative, sharing an adapter, conflicts with delivering high performance.

REGULATORY APPROVALS, COMPLIANCE

Emissions	Stand alone PCIe adapters are not certified by emissions or safety authorities as they only apply to complete systems. CSPi uses a third-party certification organization to test its Myricom adapters installed into a generic PC. Final test reports are available to customers. We meet US, Canadian, and European emissions, Class A.
Compliance	RoHS (Reduction of Hazardous Substances)
Country of Origin	USA

PART NUMBERS

10G-PCIE3-8D-2S+DBL	Network adapter with Dual SFP+ 10GbE ports (configured as a dual QSFP with bundled SFP+ adapters) and Myricom DBL™ software.
10G-8D-2SA-SYNC-KIT	Optional front panel kit with timing inputs for the 10G-PCIE3-8D-2S network adapter.
10G-PCIE3-8D-Q+DBL	Network adapter with Single QSFP (configured as four 10GbE ports) and Myricom DBL™ software. Requires the purchase of a breakout cable.
10G-8D-Q-SYNC-KIT	Optional front panel kit with timing inputs for the 10G-PCIE3-8D-Q network adapter.
Cables and transceivers	Contact your Account/Sales representative for more information on cables and transceivers that are compatible with this adapter.
Warranty and add-on support	One year for hardware defects and 90 days for software defects. 90 days of “getting started” telephone and email support as well as any software upgrades shipped within that window. Refer to the support datasheet for options extending the 90-day window.

The information contained herein is subject to change without prior notice. For the latest detailed information contact your representative at +1 (626) 821-5555 or visit www.myricom.com.

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