DATASHEET

High-Speed SpeedBridge Adapter for Ethernet

Rapid system-level verification deployment

The High-Speed SpeedBridge Adapter for Ethernet is a legacy SpeedBridge Adapter that has been replaced by the High-Density SpeedBridge Adapter for Ethernet. Cadence® SpeedBridge® Adapters provide protocol interface solutions for an emulation platform to enable efficient driver and application-level testing targeting validation of pre-silicon RTL of ASICs and systems on chip (SoCs) with a Cadence Palladium® emulation system or Cadence Protium™ prototype system. SpeedBridge Adapters can also be leveraged to quickly and easily reproduce post-silicon bugs. The solution enables verification of emulated designs along with development, testing, and performance characterization of embedded software, system-level drivers, and final software application.

High-Speed SpeedBridge Adapter for Ethernet

Ethernet has become the most commonly used LAN technology worldwide. To address the verification and integration needs of Ethernet network devices, Cadence offers an off-the-shelf emulation solution for Ethernet designs. The High-Speed SpeedBridge Adapter for Ethernet offers fast bring-up times, a fast path to sophisticated verification platform, an easy connection to live networks or testers, and the ability to scale to many ports without impacting performance.

The High-Speed SpeedBridge Adapter for Ethernet connects emulated Ethernet adapter designs to networks or Ethernet testers at full speed through RJ45 connectors. The High-Speed SpeedBridge Adapter for Ethernet does not perform any switching or routing of packets—it simply forwards packets on the network side to the emulation side, and vice versa. The board operates as a transparent rate adapter between full-speed network traffic and Cadence emulation systems.

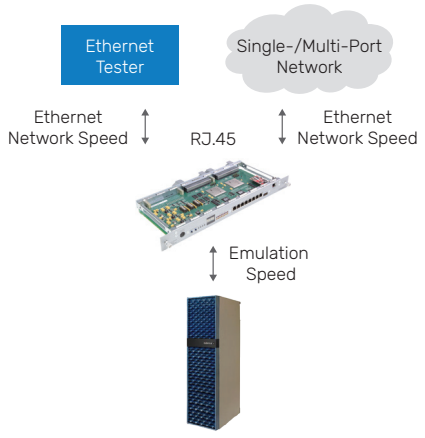

Figure 1: The High-Speed SpeedBridge Adapter for Ethernet enables high-performance emulation system verification using a single port or multi-port Ethernet tester.

When connected to a Palladium Z1 series verification platform, the High-Speed SpeedBridge Adapter for Ethernet can be used in a variety of ways to verify your design. For example, you can verify your design mapped into a Palladium Z1 platform by connecting through the High-Speed SpeedBridge Adapter for Ethernet to a live network (see Figure 1).

With the high speed of emulation, you can co-verify hardware and software running on the design with the application software running over an Ethernet network. You can have both hardware and software debug tools for ease of use, ease of debug, and high speed—so you don't have to sacrifice quality.

You can verify your design mapped into a Palladium Z1 series system with any standard Ethernet tester that can support PAUSE flow control (see Figure 1). The tester provides complex stimulus to verify your design.

One High-Speed SpeedBridge Adapter for Ethernet can support up to eight ports of MII or GMII, up to four ports of standard XGMII, up to two ports of XLGMII, or up to two CGMII ports.

Max SpeedBridge Adapter Performance*		
GMII	12Kf/s	2.4Mb/s
XGMII	95Kf/s	49Mb/s
XLGMII	190Kf/s	98Mb/s
CGMII	476Kf/s	244Mb/s

*Assumes 1MHz in emulation, 64-byte packets, and minimum IPG.

Benefits

Offers rapid verification deployment

- Provides a pre-validated emulation interface fully compatible with the Palladium Z1 series
- Provides very high performance during system verification
- Enables rapid creation of sophisticated system-level environments
- Enables verification IP reuse
- Works from one project to another project
- No need for every user to re-invent the solution due to development cost, time and complexity
- Improves productivity to get to the first test by simplifying bringup and reducing test development time by leveraging capabilities of existing testers and system environments

Ensures quality

- Tested and verified by Cadence and many other user designs
- Mature product that has been widely deployed in many emulation environments
- Cadence-provided solution lets you verify your design quickly and efficiently
- Reduces system risk
- Performs MAC/GMAC testing
- Runs Ethernet traffic between tester and MAC
- Protocol and integrity error testing (CRC)
- Uses loopback tests
- Faster and more reliable testing with large traffic push through
- Configures and tests higher-layer traffic using emulation
- Enables co-verification with software running on the network
- Runs production system software/drivers to further reduce system risk
- Validates software stack

Features

Supports multiple ports

Each High-Speed SpeedBridge Adapter for Ethernet supports up to eight ports in the following combinations:

- 8 MII
- 8 GMII
- 8 XGMII (16-bit DDR interface)
- 4 SGMII (standard 32-bit DDR interface)
- 2 XLGMII (40G)
- 2 CGMII (100G)

Up to six adapters can be placed in one chassis. Multiple adapters can be used to support any number of ports.

- Remotely configurable
- Provides a full-speed RJ45 Ethernet interface per port, supporting 1000Base-T Gigabit Ethernet or 100Base-TX Fast Ethernet
- Integrated cable diagnostics allow reliable connection of multiple High-Speed SpeedBridge Adapter for Ethernet

Conversions for standard interfaces available from MII and GMII modes

- From MII mode: SMII, S3MII, RMII
- From GMII mode: RGMII, TBI (alternative of SGMII), and RTBI
- For XAUI and SGMII converters, please contact your Cadence product marketing representative

Supported emulation speeds

- Supports full emulation speed range, including ability to start/stop emulated clocks

Enhanced debug capabilities

- Supports most popular software development environments
- Supports VCD, FSDB, and SST2 types of waveform through SimVision™ Debug
- Fully static implementation supports advanced emulation debug features of your Palladium Z1 series systems when debugging your design

Supported ethernet testers

Full-speed front end can be connected to any third-party tester, PC, or a switch that supports PAUSE frame flow control

Supported packet sizes

- Handles all regular-size packets and jumbo packets, from 64 bytes up to 16,000 bytes
- Passes all packets without modification

Enhanced remote configurability and manageability

- Provides a remote configuration interface for remote user control or scripted, automated operation
- Compatible with queued testing environments and regression
- Provides a way to remotely configure the High-Speed SpeedBridge Adapter for Ethernet[1]
- Turns on/off remote configuration interface

Specifications

- Compatibility
  - IEEE 802.3x standards for Ethernet technology
- Conversions for standard interfaces
  - MII mode: SMII, S3MII, RMII
  - GMII mode: RGMII, TBI (alternative of SGMII), and RTBI
- Remote configurability
  - Remote reset and remote configuration using one MII port
- Third-party testers
  - Supports many third-party testers that support PAUSE frames
- Flow control
  - Uses PAUSE frame
- Full-duplex supported
- Auto-negotiation required
- SpeedBridge chassis required
- Packet size
  - From 64 bytes up to 16K bytes
- Ability to stop the emulator available
- Configurable inter-frame gap
  - Support both fixed and random gaps
- Power (typical)
  - 25W maximum per High-Speed SpeedBridge Adapter for Ethernet
- Status indicators
  - LED to indicate power, mode, link, and traffic activity

Cadence Services and Support

- Cadence application engineers can answer your technical questions by telephone, email, or Internet—they can also provide technical assistance and custom training.
- Cadence-certified instructors teach more than 70 courses and bring their real-world experience into the classroom.
- More than 30 Internet Learning Series (iLS) online courses allow you the flexibility of training at your own computer via the internet.
- Cadence Online Support gives you 24x7 online access to a knowledgebase of the latest solutions, technical documentation, Rapid Adoption Kits, software downloads, and more.
- For more information, please visit www.cadence.com/support for support and www.cadence.com/training for training.

1. The port configuration listed above assumes that remote configuring is not being used. This feature disables one of the ports. Please contact your Cadence product marketing representative for more details.

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