

# CADENCE SPEEDBRIDGE ADAPTER FOR MULTI-ETHERNET

The Cadence® SpeedBridge® Adapter for Multi-Ethernet is a pre-validated in-circuit emulation solution that allows a networking device emulated in a Cadence Palladium® system to interface with a full-speed Ethernet network or Ethernet testers. It enables rapid deployment of high-performance in-circuit emulation and makes it possible to co-verify hardware and software with software running over the Ethernet network, dramatically improving verification productivity.

## SPEEDBRIDGE ADAPTER FOR MULTI-ETHERNET

Ethernet has become the most commonly used LAN technology worldwide. Until recently, networks were required to support only the transfer of files from one device to another, but as networks and computers have evolved, so have the applications in use. Ethernet evolved to support the explosive growth of network traffic and bandwidth-intense applications. To address the verification and integration needs of Ethernet network devices, Cadence offers an off-the-shelf in-circuit emulation solution for Ethernet designs.

The Cadence Multi-Ethernet SpeedBridge board connects emulated multi-Ethernet designs to networks or Ethernet testers at full speed through an RJ45 connector. The Multi-Ethernet SpeedBridge board does not perform any switching or routing of packets—it simply buffers data on the network side and reproduces the same data on the emulated side, and vice versa.

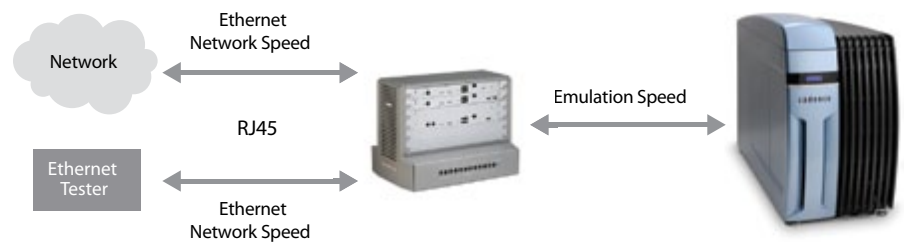


Figure 1: The Cadence Multi-Ethernet SpeedBridge adapter enables high-performance emulation system verification using live network and/or Ethernet tester.

The board operates as a transparent rate adapter between live network and Cadence emulation systems.

When connected to a Palladium series verification platform, the Multi-Ethernet SpeedBridge board can be used in a variety of ways to verify your design. For example, you can verify your design mapped into a Palladium XP platform (XL, GLX) or a Palladium II/III system by connecting through the Multi-Ethernet SpeedBridge board to a live network (see Figure 1).

With the high speed of in-circuit emulation, you can co-verify hardware and software with 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 series system with any standard Ethernet tester that can support PAUSE flow control (see Figure 1). The tester provides different stimulus to verify your design.

## BENEFITS

### OFFERS RAPID IN-CIRCUIT VERIFICATION DEPLOYMENT

- Provides a pre-validated in-circuit emulation (ICE) interface known to work with the Palladium series
- Enables the creation of a system-level environment

### 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 eliminating environment setup and debug time

### ENSURES QUALITY

- Tested and verified by Cadence and many other user designs
- Cadence-provided solution lets you verify your design quickly and efficiently.

### REDUCES SYSTEM RISK

- Performs MAC/GMAC testing with a tester interface
- Runs Ethernet traffic between tester and MAC
- Checks protocol and integrity errors (CRC)
- Uses loopback tests
- Sends large traffic through
- Configures and tests higher-layer traffic using emulation
- Enables HW/SW co-verification with software running on the network
- Runs system software/drivers
- Validates software stack

## FEATURES

### SUPPORTS MULTIPLE PORTS

Each SpeedBridge Adapter for Multi-ethernet supports 8 MII, 8 GMII, or 2 XGMII ports in the following combinations:

- 8 MII
- 2 GMII and 6 MII
- 4 GMII and 4 MII
- 6 GMII and 2 MII
- 8 GMII
- 2 XGMII

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

- Configurable dip switches allow users to enable/disable ports
- Provides RJ45 connectors for all the ports

### 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
- Up to MHz

### ENHANCED DEBUG CAPABILITIES

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

## SUPPORTED ETHERNET TESTERS

Full-speed 100BaseT 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 20,000 bytes without dropping
- Configurable inter-frame gap
  - Supports both fixed and random gaps
- Passes all packets through the SpeedBridge board without modification

## ENHANCED REMOTE CONFIGURABILITY AND MANAGEABILITY

- Provides a way to remotely reset the SpeedBridge board
- Provides a way to remotely configure the SpeedBridge board<sup>1</sup>
- Turn on/off remote configuration interface

## SPECIFICATIONS

- Compatibility
  - IEEE 802.3x standards for 10/100/1000/10000 Mbps Ethernet technology
- Available ports
  - Up to 8 full-speed 10/100Mbps RJ45 ports: 8 MII, 8 GMII, or 2 XGMII emulation speed ports per SpeedBridge board in configuration described in this datasheet
- Conversions for standard interfaces
  - MII mode: SMII, S3MII, RMII
  - GMII mode: RGMII, TBI (alternative of SGMII) and RTBI.

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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.

For XAUI and SGMII converters, please contact your Cadence product marketing representative.

- Emulation side
  - Supports MII/GMII/XGMII
- Network side
  - Supports 100BaseT
- 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
- Half duplex
  - Please contact your Cadence product marketing representative
- Full duplex supported
- Auto negotiation required
- SpeedBridge chassis required
- Packet size
  - From 64 bytes up to 20k bytes
- Ability to stop the emulator available
- Configurable inter-frame gap
  - Support both fixed and random gaps
- Power (typical)
  - 5VDC@1.3 amps or 6.5 watts

- 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 25 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, software downloads, and more

For more information about this and other products contact:

**1.800.746.6223**

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