

# Channel Designer

## HIGH-SPEED SERIAL LINK ANALYSIS

Use Channel Designer to:

- ✔ Determine bit error rates (BER) in high-speed serial link designs
- ✔ Develop chip-level AMI transmitter and receiver models
- ✔ Simulate jitter and noise in designs operating at 10 gigabits and beyond
- ✔ Evaluate chip-level signal conditioning and clock data recovery (CDR)
- ✔ Graphically represent channels to include progressively refined models
- ✔ Accurately simulate S-parameter data
- ✔ Efficiently analyze multiple serial channels with bus sweeping
- ✔ Make quick assessments with channel templates and generic AMI models
- ✔ Evaluate the quality of high-speed serial links

Channel Designer™ provides a comprehensive environment for the accurate assessment of high speed serial links to ensure robust IC package and PCB implementations. Chip suppliers use Channel Designer as they create IBIS Algorithmic Modeling Interface (AMI) transmitter and receiver models. Package and board teams use Channel Designer to predict overall bit error rates (BER) and to determine if jitter and noise levels are within specified tolerances. Channel Designer offers unsurpassed accuracy and ease-of-use.

### Comprehensive Analysis Environment

#### Simulating Channel Behavior

Design alternatives are rapidly simulated with Channel Designer to assess end-to-end serial link performance. Designs with multiple serial channels benefit from efficient bus sweeping which automates the analysis of feasible scenarios. Channel Designer is able to determine the effect of crosstalk on jitter for designs operating at 10 gigabits a second and beyond. Channel Designer supports even, odd, worst case and random crosstalk analysis. Neighboring signals can be turned on and off in phase, out of phase and at random. Channel Designer determines the effectiveness of chip-level signal conditioning and clock data recovery (CDR) while supporting rapid improvements in the channel's design.

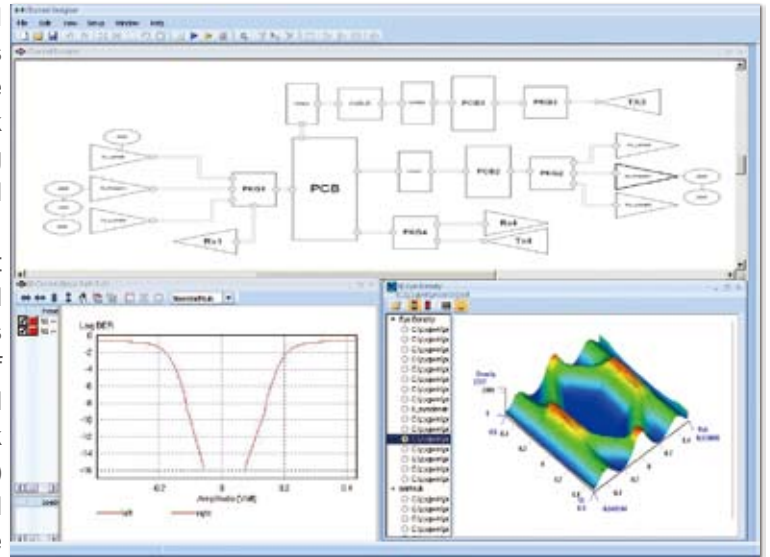


FIGURE 1. 2D and 3D eye diagrams and bathtub curves enable quick identification of channel issues.

#### Accurate Simulation

It is extremely challenging to identify a handful of potential errors when simulating millions of bits of data across a complex high-speed channel. Sigurity's production proven time-domain simulator provides unequalled precision over a wide frequency spectrum from DC to tens of gigahertz. Advanced S-parameter handling ensures passivity and causality to avoid misleading results. This detailed view is critical for meaningful BER assessment.

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### Algorithm Modeling Interface (AMI) Support

AMI has emerged as a vital industry standard for transmitter and receiver models to support system designs that include devices from multiple chip suppliers. Channel Designer goes beyond basic AMI support by uniquely supporting cascaded AMI models. As an example, various equalizer models can be used with a stand alone CDR model. Channel Designer comes with a number of generic AMI models that cover a range of signal processing technologies to support early design analysis.

### Design Flow

Channel Designer includes a unique net-based block-wise schematic editor to rapidly capture a single net or a complete multi-board bus. Work with Channel Designer can begin once the target serial link is identified. Progressively refined models are swapped in as the design takes shape. Basic channel templates are provided with Channel Designer. Later, detailed S-parameter models can be used to maximize accuracy. Sigrity's open Model Connection Protocol (MCP) simplifies and automates hook up. This avoids tedious and error prone model connection tasks. Graphic and text based outputs are provided with Channel Designer along with post processing to determine channel robustness and to identify potential risks.

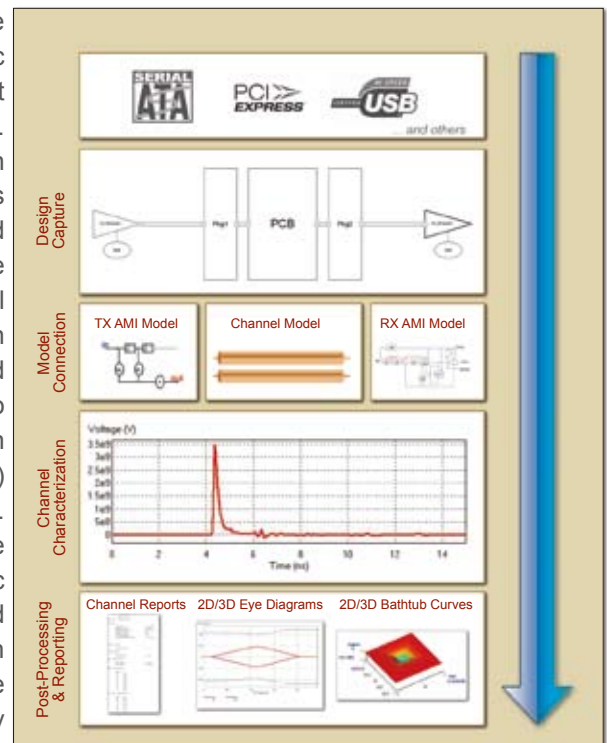


FIGURE 2. Channel Designer can be used at every phase of the design process.

### Interfaces

- Available for use with Windows and Linux.
- Interfaces to PCB and IC package layout data bases from Sigrity, Cadence, Mentor Graphics, Altium, Zuken, etc.
- Supports many high-speed serial links including PCIe, Xaui, InfiniBand, SAS, SATA and others.